FINANCING COST AND PRIVATE INVESTMENT IN GHANA

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THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL FINANCE DEGREE

JUNE, 2010
DECLARATION

I, JOSEPHINE OFOSU-MENSAH ABABIO (MRS), do hereby declare that except for references to other works, which have been duly acknowledged, this thesis is entirely my own work, and that neither the whole nor part of it has been submitted for another degree elsewhere.

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This thesis is dedicated to my beloved father, MR. SAMUEL KWASI NTIRI, who sacrificed marriage for our education and good nurturing.
ACKNOWLEDGEMENTS

My profound and utmost gratitude to the Almighty God for His grace and favour which have seen me through this arduous academic feat.

With a very grateful heart, I thank my able and indefatigable supervisors, Dr. Kofi Osei and Mr. Sarpong Kumankuma for their invaluable advice, comments, constructive criticisms and suggestions during the course of writing this thesis. I also appreciate very much their concern and encouragement during the ill health of my child.

I acknowledge, with thanks and appreciation all the lecturers of the University of Ghana Business School, most especially lecturers of the Department of Finance, whose contributions in diverse ways have seen to the successful completion of this work. I deeply appreciate the assistance and encouragement from Dr. Adjasi, Mrs. Esther Asiedu, Mr. Ojorbio and Mrs. Josephine Amuzu, all of the Business School, University of Ghana.

I would like to put on record my indebtedness and immeasurable gratitude to Dean of Graduate School, Professor (Mrs) Yaa Ntiamoah Baidoo, the acting Dean of the Business School, Mr. Takyi Asiedu, the Executive Secretary of the Business School, Mr. Tabi and the head of Department of Finance, Professor Joshua Abor, for approving the request to pursue this MPhil. Program.

A special note of gratitude to the staff of Balme Library, for allowing to bring my child there to work and also to the Liberians of the Business School, Mr. Afenyo and the Department of Economics, Mr. Anane, for permitting me to borrow journals and textbooks to enable me to work outside their libraries.
I wish to express my sincere thanks to the staff of the Department of Research, Bank of Ghana for providing me most of the data I requested for. I own profound thanks and acknowledgement to the various authors mentioned in the reference section of my work.

My heartfelt gratitude and appreciation goes to my husband, Mr. Ofosu-Mensah Ababio and my children; Nhyira Ofosu-Mensah, Aseda Ofosu-Mensah and Adom Ofosu-Mensah, for the financial assistance, encouragement and the many sacrifices they have to make to enable me pursue this programme.

Meanwhile, I wholeheartedly deem it my sole responsibility for any errors or omissions in this thesis.

JOSEPHINE OFOSU-MENSAH ABABIO (MRS)
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ABSTRACT

This study has investigated empirically the effect of Financing Cost on Private Investment in Ghana, over the period 1970 - 2008. To this end, the variables used were classified as Cost factors and Non Cost factors of private investment, using the latter as control variables. The private investment function derived is a variant of the flexible accelerator principle designed to account for the objective of the study. It employed the Augmented Dickey–Fuller (ADF) test to address the problem of unit root faced in time series analysis. The long run estimate of the private investment function for Ghana was estimated using the Johansen co-integration technique. The Error Correction model was used to determine the short-run dynamics of the variables used in the model.

The study found that all the cost factors (interest rate, inflation rate, exchange rate and budget deficit) had negative and statistically significant impact on private investment in the long run. On the other hand, in the long run, the non cost factors (credit to the private sector, real GDP and public investment) impacted positively on private investment but external debt had adverse effect. The results also found that with the exception of the stock market variable, all the variables used co-integrated with private investment. The study further revealed that not all the variables used were significant in the long run, since variables such as public investment and external debt had the expected signs but were not significant.

This study provided direct evidence that high cost of financing is associated with low private sector participation in investment activities in Ghana. Accordingly, the study recommended among others that long term policies should be directed towards cost control and macroeconomic stabilization in order to boost private investment in Ghana.
CHAPTER ONE
INTRODUCTION

1.0 Background of the Research

Investment is fundamental for economic growth both in the developing and developed
countries. Recent empirical studies conducted in Africa, Asia and Latin America have
established beyond doubt, the critical linkage between investment and the rate of growth
Throughout the 1990s, the ratio of total gross domestic investment (GDI) to gross domestic
product (GDP) in Asia, which experienced a high average rate growth compared with the rest
of the world, was about 27 percent, while in Latin America and sub-Saharan Africa the
corresponding ratios were 20 percent and 17 percent respectively, (Seruvatu and Jayaraman,
2001).

The desire for growth and development of the economies of developing countries brought up
the issue of the role of the private sector. Private sector investment is noted as being directly
related to economic growth in developing countries. Hence the emphasis is now on private
investment as the engine of economic growth and development. Econometric evidence
(Beddies 1999, Ghura and Hadjimichael 1996, Ghura 1997) indicates that private investment
has a stronger, more favorable effect on growth rather than government investment, probably
because private investment is more efficient and less closely associated with corruption. It is
estimated that the ratio of private investment to GDP in the sub-Saharan African countries
which had experienced poor rates of growth in the 1990s was less than 10 percent, compared
with 16 percent in Latin America, 18 percent in advanced countries and 16.5 percent in newly
industrialised countries in Asia (Hernandez-Cata 2000). Viewed against the background of growing evidence of a strong link between high private investment and sustainable growth, a steady decline since the mid 1970s in Ghana’s GDP has been a matter of considerable concern to policy makers. Furthermore, in the context of observed policy shift in the 1980s, placing a greater emphasis on the private sector following the initiation of public sector reforms, a perceptible slide in the ratio of private sector investment to GDP is all the more worrying (Aryeetey, 1994).

The much-awaited role of the private sector as an engine of growth has not yet materialized in developing countries including Ghana. This may be largely due to the fact that wealth holders, in behaving rationally, prefer holding their wealth in foreign assets and government securities rather than in real domestic assets due to high risk and low returns associated with real domestic assets. Consequently, in most developing countries, policies have been formulated to promote reduction in cost of financing investment projects in order to increase investment vis-a-vis growth. This is due to the observation of existence of high correlation between investment and growth, given empirical evidence of the East Asian exemplary growth attributed to investment (Kipngetich, 2003).

In recent years, emphasis has been put on the development of the private sector, in developing countries to help boost economic growth and reduce poverty. For example, the International Financial Corporation created the African Enterprise Fund, and the United States via its Overseas Private Investment Corporation initiated the African Growth Fund. In the early 1990s, a strategy was introduced by the African Development Bank to help boost private investment to 25 percent of GDP (Pfefferman and Madarassy, 1990). In the context of Ghana, the government adopted a comprehensive package of policy reforms aimed at creating an
improved business environment since the 1980s. The World Bank, through the International Finance Corporation, provided financial assistance to help private enterprises. During that same period the IMF concluded an Enhanced Structural Adjustment Agreement with Ghana, which was designed to promote the private sector, alleviate poverty, and strengthen governance. More recently, the Ghana government submitted a new private sector development strategy to the World Bank. The overall objective of the strategy is to enhance the investment climate of the country and to help achieve and sustain steady private sector based GDP growth which in turn would create jobs.

Investment generally is present sacrifice for future benefit. Investment in an economy is composed of public and private sector investment. Public investment refers to investment by the government sector primarily, but not exclusively, in the areas of social and economic infrastructure. Private investment refers to investment by private businesses for the purpose of profit generation. Domestic government and citizens or foreign governments and citizens can own both public and private investment. Thus investment at any given time in an economy can also be divided into domestic investment and foreign direct investment (FDI). Investment can be in the form of fixed business investment (buildings, equipments, real estate); current investment (inventory); changes in business investitures (installation, inaugurations) or in financial assets such as stocks and other securities. Some of these investments are of short term duration while others are of long-term duration.

Investment projects with long term horizons generally require long term financing. In Ghana, due to high cost associated with long term financing (Asante, 2000), a number of businessmen or enterprises tend to use short-term sources of funds, usually bank borrowing, in financing major investment projects. These projects include expansions, introduction of new products,
acquisition of new plant and machinery or equipment. Subsequently, a number of enterprises run into financial difficulties as they try to either renegotiate credit facilities with their banks, contract new loans to repay existing debt, or are simply unable to honour their obligations. The idea of contracting short term facilities with a view to renegotiate or extend on due dates is rather costly and does not facilitate long-term planning (Brealy and Myers, 2007).

Financing and Investment decisions are thus theoretically interdependent. Myers and Majluf, (1984) have explored this interdependency and there is ever increasing themes in that exploration. Financial decisions consist of a number of interdependent decisions with the result that financing decisions generally affect the firms cost of capital (financing cost) which in turn affects the firm’s investment decisions. Thus it is argued that a firm’s investment decisions could depend on the financial constraint of the firm. Brealy and Myers (2007), observe that investment decisions are simpler than financing decisions because projects are often evaluated wrongly, on a stand-alone basis; such that financing cost is not included.

According to the businessdictionary.com, financing cost: in general means, price of obtaining debt (loans and bonds) and equity (common stock) capital. Also, according to Baum and Tolbert (1985), interest, inflation, exchange rates among other macroeconomic variables are price. According to Jongwanich and Kohpaiboon, (2008), the user cost of capital can be grouped into three- Interest rate, depreciation and the price of obtaining the capital stock. In Ghana, firms cannot effectively raise much funds needed to finance investment because cost of finance is a major obstacle (Asante, 2000). The implication of high cost of financing is that firms rely on internally generated funds rather than external sources of funds. Traditionally, long-term sources of finance include: Internal sources that is retained earnings (internally generated cash flow from operations that is reinvested in the firm); External financing
generally consisting of debt (loans and bonds) and equity (common stock). These may be in the form of bank borrowing, expanded trade credits, equities, bonds, notes and debentures. In the broad sense, however, the two main external sources of long term financing are debt and equity. Firms have the choice of issuing either equity or debt securities or a hybrid of the two.

The effect or impact of financing cost on a firm’s rate of investment is of much concern. The present value rate of investment decision is determined through the cash flow of the investment. The cash flow is based on the costs and revenues associated with the investment. Government policies often affect factors like cost of inputs, prices of output, exchange rates, deficit spending, taxes, interest rate, inflation rates etc. Consequently, unavailability of favourable policies will affect investment decisions. The growth of an economy depends on the rate of investment particularly private investment. Therefore any effect on private investment resulting from a change in cost of financing will subsequently affect the growth of the economy. Hence, this research is an attempt to investigate how financing cost has affected private investment in Ghana.

1.1 Research Problem

High cost of financing private investment is a major problem to the private sector in Ghana. Private enterprises are increasingly finding it difficult to attract and repay credit needed for their investment projects. The main challenge facing private enterprises is access to affordable credit, (Asante, 2000). This state of affair has made it difficult for these private enterprises to attain their corporate goals and to compete in a dynamic environment. Cost of financing has been a major impediment to private investment due to the changes in the variables such as; interest rate, exchange rate, budget deficit and inflation rate etc that influence them.
The results of the Modigliani and Miller theorem is that under perfect conditions the investment and financing decisions of the firm are independent and therefore, can be made separately but on the contrary capital markets are sufficiently imperfect that firms must consider financing in their investment decisions. Myers and Majluf (1984), argue that information asymmetries lead markets to undervalue firms with the consequences that firms rely on internal funds to finance investments. However, when internal funds are fully exhausted, firms fall on external finance and where external funding is at high cost, it is likely to lead to a problem of underinvestment. Thus the central theme of this study is the evidence of Ghanaian private firms' investment sensitivity to financing cost. Ghana, like many other developing countries has limited domestic resources for its economic development.

In consequence to this, all efforts must be made to mobilize the available resources for her development if the objectives of vision 2020 are to be achieved. Specifically, the vision 2020 projects total investment, to be 26.0% of GDP by the year 2000. Of this, total private investment was estimated to be 16.5% of GDP while total public investment was to be 9.5% of GDP (Ghana Vision 2020 the first step: 1996 – 2000). However, available statistics show that even though private investment as a percentage of GDP was 7.9% in 1970, this dropped to 5.24% in 1986 and by 1996 it has drastically reduced to 2.04%. At the same time, the ratio of public investment to GDP has been increasing. Even though private investment increased to 4.23% in 1997 while that of public decreased to 10.42% in the same year, it appears the mobilization of resource for investment vis-à-vis growth and development has not been effective due to high interest rates on loans in particular. Against this background there exist a gap between desired and actual investment and the response of the private investment to this gap depends mainly on affordable cost of finance among other factors.
The ability of the private sector to play the role as the engine for economic growth more effectively will depend on the ease with which the private sector mobilizes funds for investment. This obviously can be achieved in the presence of affordable credit or finance. Then the issue of cost of finance becomes important and in particular, how cost of finance affects private investment. Unfortunately, very little empirical work has been done on this issue in Ghana. One major work done by Asante, (2000) examined the Determinants of Private Investment behaviour in Ghana and finds that the cost of finance constituted about 82% of the impediment to private sector participation in investment in Ghana. Similarly, Aryeetey, (1994), studied Private Investment under Uncertainty in Ghana and also finds that macroeconomic stability that ensures private sector participation in investment in Ghana is a necessity.

However, while Asante’s work did not only examine finance cost variables independently on private investment, Aryeetey’s study equally ignored the role of variables such as the stock market or domestic savings. This research is therefore, different from the previous studies because it applies the Johansen multivariate co-integration approach to examine the effect of cost of finance on private investment and as well test for the direction of causality between finance cost variables and private investment in Ghana. Further, even though, private investment behaviour has been studied in Ghana, the focus of those studies were on the determinants, uncertainties, irreversibility, financial liberalization, macroeconomic conditions and fiscal impact on private investment (Asante, 2000; Aryeetey, 1994; Pattillo, 1996; Killick, 1978).

Financing cost has come up as an important issue in private investment. Financing cost is therefore noted to be a necessary factor in private investment decisions. However, empirical
work on cost of financing on private investment is virtually unavailable in Ghana, hence the key motivation for this research. Thus, the impact or effect of financing cost on private investment remains to a large extent unexplained. Indeed the proposition favouring private sector response to the high cost of finance for projects appear to rest more on theory than on empirical studies. Without such empirical studies, however, Ghana will not find itself in a good position when it comes to designing policies intended to stimulate private investment.

1.2 Objectives of the Research

The foremost objective of this research is to assess and analyze the impact of the various forms of financing cost factors independently on private investment in Ghana. In order to achieve this objective, the study identified relevant cost variables as well as other relevant non cost variables that determine private investment, using the latter as control variables.

More specifically, the study pursued the following objectives:

i. To find the relationship and the direction of causality between financing cost factors and private investment in Ghana over the long run.

ii. To determine the impact of the control variables: non cost factors on private investment in the long run.

iii. To establish whether any of the variables used co-integrate with the dependent variable: Private Investment.

iv. To make appropriate recommendations based on the findings.

1.3 Hypothesis

The study evaluated the following hypotheses:

$H_{0a}$: Financing cost factors have negative and significant impact on long run private investment in Ghana.
$H_{1a}$: Financing cost factors do not have negative and significant impact on long run private investment in Ghana

$H_{0b}$: All the determinants of private investment identified in the literature and used in the model have significant impact on the long run private investment demand function in Ghana

$H_{1b}$: At least one of the determinants of private investment identified in the literature does not have significant impact on the long run private investment demand function in Ghana

$H_{0c}$: There exist a cointegration among the determinants of private investment and private investment in Ghana.

$H_{1c}$: There is no cointegration among the determinants of the private investment and private investment in Ghana.

1.4 **Significance of the Research**

Even though the effect of financing cost on private investment is noted, much empirical work has not been done on it. This has provided the interest in undertaking this research. The significance of the study is to make beneficiaries of this study know that a firm's success depends on its ability to raise affordable funds to finance its investment programs. The results from the study will also provide an insight into the importance of financing cost as a tool for success in business, to entrepreneurs in Ghana and beyond. Thus this research will provide an insight into how cost of financing influence private investment decisions and as well bring to light how lack of private investment hampers economic growth and national development.

Also, this study will contribute significantly towards efforts at improving private investment in Ghana. Thus the present research will contribute immensely to investment growth and survival in Ghana particularly private sector investment. The research outcome will greatly influence Ghanaian policy making for the private sector. It will inform policy makers as to
which variable of financing cost really impede private investment in a developing country like Ghana, so that appropriate measures can be taken to curb its effect. The study would be of much importance to the academia, finance practitioners, policy-makers, regulators and the general public as well as serve as a reference point for further studies or research.

1.5 Organization of the research

The research has been organized in six main chapters: Chapter one looked at the background of the research, research problem, objectives, hypothesis, significance and organization of the research. Chapter two presented an overview of the Ghanaian Economy and Investment in Ghana. Chapter three reviewed, discussed and synthesized detailed literature on the study. In this chapter literature on Investment, Financing Cost and other related concepts were reviewed. The literature review formed the basis upon which the methodology and data analysis were carried out. Chapter four outlined the detailed methodology used in the study. The chapter detailed the type and sources of data used for the study, the approach and strategy adopted to achieve the objectives of this empirical research. The econometric model used was well detailed in this chapter where consideration of a suitable model of investment was given. Chapter five looked at data analysis and presentation of findings from the study. Thus, findings from the econometric results were presented in this chapter. Chapter six summarized, concluded the research work and gave policy recommendations, limitations as well as suggested area for further research.
CHAPTER TWO
OVERVIEW OF INVESTMENT IN GHANA

2.0 Introduction

This chapter presents an overview of investment in Ghana, by reviewing the developments in the Ghanaian economy, domestic private investment in Ghana, foreign direct investment in Ghana and measures to stimulate the performance of private investment in Ghana.

2.1 Developments in the Ghanaian Economy

A look at the Ghanaian economy shows that it experienced a sudden and dramatic decline in the 1970’s and early 1980s. During this period, GDP grew at an average rate of 0.2 percent, which was far below the rate of population growth of about 3 percent per annum. The Economic Recovery Program (ERP) introduced in April 1983, contributed to reversing the negative growth rate in GDP experienced in the 1970s and early 1980s. GDP recorded an annual growth rate of 5 percent in 1985 and 1986. Since 1986, the growth rate of GDP has been positive although it has been below target in some years. Policies were implemented under the ERP to enhance the performance of industry. The strategies adopted involved the development of a more internationally competitive industrial sector based on increased exports and efficient import substitution. Also, measures were introduced to attract entrepreneurs and investors particularly, the private sector into all major sub-sectors with emphasis on the development of appropriate technologies in the small and medium-scale manufacturing sector. (Samuel, World Bank, 1989).
Aryeetey (1994), though Ghana’s economic crisis started from the early 1960’s and mounted in the 1970s, it was in the early 1980s that its near collapse became evident. To sum up, domestic savings and investment declined rapidly both in the public and private sectors. Thus the growth dynamics of the economy vanished. This resulted in a steady decline in output. However, population continued to grow at an average of about 3 percent per annum resulting in the decline of the per capita income. The need for investment in Ghana was realized early. Thus efforts were made to provide investment incentives under investment codes and through other legislation. The first investment code was the Pioneer and Companies Act of 1959. As the need for foreign investment was realized, the Capital Investment Act of 1963 (Act 172) was introduced to encourage foreign investment. The 1973 Investment Decree (NRCD 141) and Investment Policy Decree (NRCD 329) of 1975 were introduced to centralize investment promotion functions at the Capital Investment Board and consolidate all investment legislations.

The 1985 Investment Code (PNDCL116) established the Ghana Investment Centre to serve as the Central Investment Promotion Agency. In order to revise the laws relating to investment and provide for other related matters, the Ghana Investment Promotion Centre Act, 1994 was promulgated to re-establish the Ghana Investment Centre for the encouragement and promotion of investment. The climate of private investment in Ghana has been poor due to macroeconomic imbalances. The political climate of the country in the late 1970s and the early 1980s further reduced interest in private investment. The high inflation rates also served as a tax on private savings as real interest rates were negative. The policy of fixed exchange rate adopted for a long time resulted in the overvaluation of the domestic currency. Lack of foreign exchange coupled with import controls affected the importation of inputs thereby reducing interest in private investment, (Aryeetey, 1994).
A number of policy reforms have been included in the ERP to enhance the promotion of private sector development in the country. These policies were intended to provide incentives to private investors and strengthen the private sector. Thus a crude estimate shows that in 1986, 64.3 percent of the GDP was generated by the private sector. The private sector accounts for about 50 percent of the output in the trade, agricultural, manufacturing and transport sectors. However, private investment can be said to have recovered in limited terms and has not reached the level expected since the reforms began. Private investment has been targeted at 15 percent of GDP per annum in the second half of the 1980s but it actually increased from 2.9 percent in 1983 to 5.4 percent in 1985 and went down again to 2.4 percent in 1986. Private investment increased from 5.5 percent to 8.7 percent during 1987-1990. This includes an increase in foreign direct investment in the gold mining sector. Apart from the growth in the mining sector with the support of multilateral loans, the private sector performance has not been encouraging particularly the manufacturing sector. (World Bank, 1990).

The private sector investment levels have been low in the 1980s compared to the public sector. Public investment grew from 6 percent of GDP in 1986 to 8.2 percent in 1995 and estimated at 8 percent in 1996. Private investment however, recovered from 1990 onwards and is about 10 percent of GDP for the 1993 to 1996 period. Gross domestic investment was 20 percent in 1960. By 1970, the investment to GDP ratio was about 14.2 percent. This dropped below 5 percent in the early 1980s with 1982 recording about 3.4 percent of GDP. Though the investment GDP ratio has been increasing since 1984, it has remained below the level of the early 1960s with an average of about 19 percent. In 1990, the share of investment in GDP rose to about 15 percent made of 8 percent private investment and 7 percent
government investment. This level of private investment according to the World Bank is low and requires a growth rate of about 15 percent to 20 percent of GDP to push the economy forward (World Bank, 1990).

Though inflation was low immediately after independence, it attained double digits in 1964. Between 1967 and 1972 it was moderate but soared up after a rate of about 10 percent in 1972 reaching triple digits of about 117 percent in 1977 and 1981. In 1983, the rate of inflation attained an all high level of about 123 percent. Since then efforts have been made to curb the high rates of inflation in the economy. Though it has been high throughout the ERP period and in the 1990s, remarkable achievements have been made. The rate of inflation dropped to about 10 percent in 1985, after fluctuating between 25 percent in 1992. However, efforts by the Bank of Ghana could not sustain this low level of inflation and it started gradual rise again reaching about 60 percent in 1995. (Aryeetey and Harrigan, 2002).

In the period prior to the 1960s, international trade and payments in Ghana were relatively a free system. In the 1960s however, restrictive foreign exchange regime involving licensing and control systems were introduced. The introduction of a fixed exchange rate system in the midst of hyperinflation and balance of payments problems in the late 1970s and early 1980s resulted in a sharp fall in Ghana’s foreign trade during the period. The share of total external trade to nominal GNP fell from 39 percent of GNP in 1975 to about 6 percent in 1983 and in the 1990s, remarkable achievements have been made. The rate of inflation dropped to about 10 percent in 1991 and went further down to 10 percent in 1992. However, efforts by the Bank of Ghana could not sustain this low level of inflation and it started a gradual rise again reaching about 60 percent in 1995. In the period prior to the 1960s, international trade and payments in Ghana were relatively a free system. In the 1960s however, restrictive foreign
exchange regime involving licensing and exchange control system in the midst of hyperinflation and balance of payments problems in the late 1970s and early 1980s resulted in a sharp fall in Ghana’s foreign trade during the period (Aryeetey and Harrigan, 2002).

A major characteristic of the ERP has been massive reforms in the exchange rate regime. The country moved from the era of fixed exchange rates to “managed float” regime in which rates are determined at weekly auctions. In April 1983, a system of multiple exchange rates based on bonuses and surcharges applied to specific transactions were tried and abandoned. In October 1983, there was a unification of the exchange rate system at the rate of C30.00=US$1.00. The exchange rate of the cedi was adjusted three times in 1985 resulting in a rate of C60.00=US$1.00. In January 1986, the exchange rate was again adjusted to C90.00=US1.00. As a further step to liberalize the foreign exchange regime, the government of the PNDC introduced the auction system in September 1986. Under this system, the rates are determined through the “market forces” through bidding under the supervision of the Bank of Ghana. The auction system involved two windows. “Window 1” was responsible for some transactions described by the government as “vital transactions”, for example crude oil purchases, essential drugs, government debt servicing and cocoa exports. These transactions went on with the exchange rate of C90.00=US$1.00. All other transactions went on at “Window 2”. The first auction was held on September 1, 1986 at the rate of C128.00=US$1.00. The two windows were merged in February 1987 and all foreign transactions took place at the auction, determined rates (World Bank, 1994).

Until 1987, interest rates in Ghana were fixed by the Central Bank. These had always been fixed behind the rate of inflation. In 1977 with inflation at about 117 percent, the lending rate was fixed at 12 percent and the deposit rate was 8.50 percent. It was raised to 15.50 percent in
1986. There has been a gradual increase in the lending rate from 21.82 percent in 1987 reaching 29.45 percent in 1991 before starting a gradual decline reaching 20.96 percent in 1996. The deposit rate increased from 15.33 percent in 1987 and reached 20.67 in 1991 before declining gradual reaching 13.5 percent in 1996. With the high level of inflation rates, the real interest rates (deposit and lending) have been negative between 1972 and 1983. Throughout the 1980s, except in 1985, the real rates of interest had been negative. For example in 1980, the real deposit rate was -26 percent and the real lending rate was about -21 percent. In 1987 the real deposit rate was about -16 percent and real lending rate about -7 percent. As part of the liberalization policies, in 1987 interest rates were allowed to be freely determined by the forces of demand and supply (World Bank, 1994).

The effect of macroeconomic instability on private investment in Ghana has been mentioned by Asante (2000). Looking at the trends in inflation, as mentioned earlier it is clear that inflation has been high in the country. Comparing the trends in inflation with real private investment in Ghana, one can clearly see a relationship between inflation and real private investment. Between 1970 and 1983 when inflation was highly volatile, the level of real private investment was very low. This volatile nature of inflation was bound to create uncertainty in the minds of investors with regard to certain policies. For example, savings have been regarded as a necessary source of investment financing. In order to boost savings, policies during the ERP period, aimed at restoring positive real interest rates. Since inflation was high, the focus was on increasing nominal interest rates in order to achieve this objective. The result of this policy has been a high cost of credit. The trends in real exchange rate, and private investment in Ghana, also, show a clear negative relationship between the real exchange rate and real private investment in Ghana.
Up to about 1982, when the real exchange rate was appreciating, private investment in the country was very low. This was the period when the country adopted the fixed exchange rate system. Nominal exchange rates were far below the real exchange rate. The likely result of this was capital flight. With the introduction of the flexible exchange rate during the ERP period, the real exchange rate started depreciating. Real private investment responded by increasing. However, these developments in the real exchange rate create doubts in the minds of investors. The flexible exchange rate resulted in an increase in the value of the cedi of debts on past imports of inputs. Also, the perceived costs of importing of inputs had gone high and will certainly affect their investment decisions (Aryeetey (1994).

In addition to the volatile economic environment, Aryeetey, (1994) noted the credibility of government policies as very essential to private investment decisions in the country. Government policies in 1979 and 1982 regarding private property created doubts in the minds of the private sector as to the credibility and sustainability of these policies. Such volatile political and economic environments affect prices (cost of funds) and thus create insecurity regarding them. It is therefore necessary to look at the extent of the influence of cost of funds on private investment.

2.2 Domestic Private Investment in Ghana:

Ghana began its journey to sustainable growth and development through rapid industrialization in the 1960s, using variety of control measures and state intervention. During the 1970s and early 1980s, economic policies were simultaneously not conducive to investment and discouraging to saving, especially in a useful financial form. This period was also characterized mainly by political instability; inconsistent economic and public policies; and economic decline (Aryeetey and Harrigan, 2002). The economic and public policies were
likewise not conducive for private investment in Ghana. Moreover, by the perception of uncertainty in political and economic environment, the picture of private investment in Ghana over the years seemed gloomy.

Private sector investors were deterred because of risk in investment due to inappropriate measures, programs and institutions of the economy as well as financial setbacks to a large extent. Quite recently, the assurance of operating in secured and safe environment has stimulated private sector investors both foreigners and indigenes to open more and new businesses. Consequently, the private investment drive seems to be on course notwithstanding certain challenges evidently inherent in the economy.

The public policy towards private investment has changed very little overtime. The first republic under Dr. Nkrumah witnessed a seriously inhibited environment with regards to private investments. In the 1950s and early 1960s the policy of the government towards local private investment was hostile. Due to the following: the belief that there was little realistic prospect of fostering an indigenous entrepreneurial class capable of industrializing at the speed and scale they wanted; the thought that the country would be hampering its advancement of socialism if Ghanaian private capitalism were encouraged; the threat that a wealthy Ghanaian business class might pose to the president’s political power, thus Nkrumah saw the possible affluence of the local private investors as a threat to his continued reign. Ironically, the President (Dr. Nkrumah) advocated the need for foreign direct investment (FDI) with string attached (Killick, 1978).

After the overthrow of the Nkrumah government in 1966, not much was done in terms of promoting the local private sector by the National Liberation Council (NLC). Though this
regime expressed the desire to give full encouragement to the Ghanaian enterprises in the private sector, their efforts, which included tax holidays for some industries did not yield appreciable results. The NLC regime also sought to reduce some other forms of taxation in order to induce savings to support development programs but the outcomes fell short of expectations (Killick, 1978).

The Busia government (1969-1972) adopted a free market approach as the means to promote economic growth. Though this produced some recovery it was short lived. The years that followed witnessed not only low levels of investment but declining levels as well. However, the governments of the National Liberation Council (NLC) 1966-1969 and that of Prof. K.A. Busia 1969-1972, made a pro private enterprise statements. Apart from wanting more foreign private investment, their major thrust was one of assisting domestic private investment. The NLC passed a decree setting out a time table for “Ghanaianization” and the Busia government supplemented this with further legislation that accelerated this program. However, there was little change in the degree of state participation in economic activities during the NLC/Busia era. Out of 53 public enterprises and corporations that existed at the end of 1965, 43 remained wholly state-owned by the end of 1971 and five (5) new ones had been created (Killick, 1978).

During the era of the National Redemption Council (NRC) and the Supreme Military Council (SMC) 1972 to 1979, the state dominated all economic activities. The return to a command economy under these regimes sparked off political turbulence, which may have created a climate hostile to private investment. Hence, there was little success in attracting private investment. The repression and control of private sector activity during the early 1980s by the then Peoples National Defence Council (PNDC) government lead by Ex President Rawlings.
posed serious threat to private investors. Even after the introduction of the ERP, the public policy remained somewhat hostile to the private sector. Foreign companies were threatened with nationalization. In the 1990s, the state made a marked retreat from some of the advanced positions it had taken in the economy through a privatization program in which a number of state provided services were subcontracted to private operators and most of the country’s over three hundred (300) parastatals were earmarked for divesture (Gyimah-Boadi, 1991).

Finally, the government enacted relatively liberal investment and trading codes aimed at attracting private investment. In furtherance to the aforementioned positive signals, the government of the New Patriotic Party (NPP) lead by Ex President Kuffuor, since assuming power in 2001, has created an enabling environment for the private sector to flourish rather than the government engaging in direct production. To this end, the government has ensured the maintenance of macroeconomic stability as a notable means of providing an enabling environment. This is reflective in the growth and poverty reduction strategy (GPRS) programs of the government and in 2004, the creation of a sub ministry for private sector development to help in this direction.

Further, the Venture Capital Trust Fund (VCTF) was set up by Venture Capital Trust Fund Act (Act 680) which was promulgated in November 2004. The objective of the VCTF is to help private investors raise capital at affordable rates for investment activities. The rational for promoting private sector development is to enhance job creation and also accelerated economic growth. This was reflected in real GDP growth rate of 7.3% in 2008, affirming the government was indeed bent on making the private sector the engine of economic growth in foreseeable future.
2.3 Foreign Direct Investment in Ghana

Foreign Direct Investment (FDI) has been viewed as a major stimulus to economic growth in developing countries. Its ability to deal with two major obstacles, namely, shortages of financial resources, and technology and skills, has made it the centre of attention for policy makers in low-income countries in particular. It can impact the host economy through a variety of channels. Principally, it helps by adding to resources available for private investment and capital formation. The transfer of technology, skills, innovative capacity, organizational and managerial practices between countries is also enhanced through the activities of foreign direct investors, Baah-Nuakoh (2000).

The need to attract foreign direct investors into the Ghanaian economy has been one of the major policy objectives of Ghana's Economic Recovery Program (ERP), which started in 1983 under the auspices of the World Bank and the IMF. This initiative was started by the NDC administration and continued by the Kuffuor Government, which came to power in January 2001, as the encouragement of foreign private investment in Ghana is seen as an integral part of Ghana's economic policy up to date. In President Kuffuor's January 2001 inaugural address, he stated that, “Ghana is open for business and foreign investors are welcome”. The country's policy of encouraging foreign investment is demonstrated in many ways, including sending investment missions abroad and hosting major international events that focus on foreign direct investment in Ghana. Notable among these events were the 5th African-American Summit and the 3rd Pan African Investment Summit held in May and September 1999 respectively. These events generated much renewed interest in Ghana. Baah-Nuakoh (2000).
According to Ibrahim (2004), domestic investors must also be given the necessary attention as their foreign counterparts. Most often than not, domestic investors are not given the necessary attention because they are perceived as lacking the necessary capital and expertise to undertake the kind of investment that is undertaken by their foreign counterparts. It is however, high time government take a critical look at this issues by given them the necessary support to ensure their growth and sustenance. Investments by domestic investors carry some advantages, which foreign investors may lack. While foreign investors always think of repatriating profits back to their home countries, domestic investors keep theirs in the domestic economy and thereby improving on the foreign reserve base of the economy. They also employ the local population from management to labourers and as such do not have to pay huge expatriate fees in hard currencies.

2.4 Measures to Stimulate the Performance of Private Investment in Ghana

Ansah. (2007), certain measures stimulated the performance of private investment, whilst others discouraged it. Before the introduction of 1973 Investment Decree (NRCD 141) and the 1975 investment Policy Decree (NRCD 329); other Investment Acts such as the Pioneer and Companies Acts of 1957 and the capital Investment Act of 1963 had been in place. The previous Acts sought to encourage foreign investment, while the decrees encouraged both local and foreign investment. The 1981 Investment Code (Act 437) sought to centralize investment promotion functions at the Capital Investment Board and consolidate all investment legislation. The 1985, Investment Code (PNDC 116) established the Ghana Investment Centre as the main investment promotion agency.
All these investment codes attempted to provide a favourable investment climate by offering incentives to private investment. The incentives generally provided included tax holidays, accelerated depreciated allowances, exemption from import duty on machinery and equipment, investment allowance and arrangements for profit repatriation. Nevertheless, these laws did not have adequate provisions for the protection of foreign investors in respect of profit repatriation and equal opportunities. Coupled with this were the government’s compulsory acquisition of equity shares in large foreign companies and the nationalization of many others through the indigenization policy in the 1970s. The result was that foreign investment declined during the period and given that it formed a very significant component of private investment, it contributed greatly to the decline of private investment during the period.

However, several other measures were instituted later to enhance private investment behaviour. Perhaps the most important legislation that was aimed at improving the investment environment in Ghana, under the reform period, was the Ghana Investment Promotion Centre (GIPC) Act of 1994 (Act 478). The Centre as established by the Act is to serve as an agency of the government for the encouragement and promotion of investment, coordinating and monitoring all the investment activities and to revise the laws relating to investment. The Act gave foreign investors in Ghana an unconditional guarantee for a free convertibility of currencies through any authorized bank dealer as well as the transferability, dividends and net profits of foreigners, payments in respect of loan serving where foreign loans are obtained, fees and charges in respect of technology transfer agreement registered under the laws of Ghana. In addition remittances of proceeds in the event of sale or liquidation of the enterprise or any interest attributable to the investment was also provided for. By December 2000, the GIPC had registered 1160 projects mainly services (314), manufacturing (300), tourism (129),
building and construction (92) and agriculture (87) sectors of the economy. The projects have also generated a total amount of 1608.2 million US dollars with the service sector contributing the highest.

A USAID five-year sponsored program, the Trade and Investment Program (TIP), which started in 1993, aimed among other things at removing various constraints in investments and expanding exports. One major weakness identified in the investment drive was lack of effective monitoring of policies to ensure their efficient and timely implementation. In response to this, TIP put in place a mechanism called the Trade and Investment Management Unit, with a board, the Trade and Investment Oversight Committee (TIOC) comprising all the ministries and other organizations whose activities related to investment and export development. This contributed tremendously in promoting investment in Ghana as the public and private stakeholders worked hand in hand.

Other institutions which have been created to promote investment in Ghana, include, the Ghana Trade Investment Project (GHATIP), Private Enterprise Foundation (PEP), the Ghana Stock Exchange and other international initiatives. The GHATIP was established in 1998, with the aim of attracting many export-oriented investors to Ghana and to make Ghana the trade and investment hub in West Africa. The project further seeks to support the private sector development by operating an export free zone and providing finance for off-site infrastructure. In addition, it is to enhance the performance of front leading institutions like the GIPC, Customs, Immigration Service, Ghana Free Zone Board and the Environmental Protection Agency to re-engineer them into proactive trade and investment facilitators.
Under the initiative of the Association of Ghana Industries (AGI), the Ghana Employers Association (GEA), the Federation of Association of Ghana Exporters (FAGE) and the Ghana Chamber of Commerce, the Private Enterprises Foundation (PEF) was established in order to achieve the objective of making the private sector the engine of growth. The PEF has as its policy objective, the lessening of government interventions and the creation of congenial atmosphere for private investment by engaging in a continuous dialogue and establishing partnership between government, the private sector and the developmental stakeholders.

To provide long term capital for development, actions were initiated to quicken the pace of making the Stock Exchange Act of 1971 (Act 384) operational. The Ghana Stock Exchange (GSE) was given recognition as an authorized stock exchange in October 1990, even though it was incorporated in July 1989, as a private company limited by guarantee under the Ghana Companies Code of 1963 (Act 179). Later its status was changed to public company limited by guarantee. The Ghana stock exchange was adjudged the best performing capital market among emerging market in 1994 and 1998 and it currently rated one of the best stock exchanges in Sub Sahara Africa. The performance of the GSE has been encouraging as more corporate bodies showed their willingness to raise funds through the GSE.

In order to train and finance private enterprises for them to take their rightful roles of creating jobs, the Transitional Corporation and Management Division of the United Nations executed a comprehensive technical co-operation program: EMPRETEC Ghana in 1990. Since its inception, it has embarked on numerous training and workshop programs geared towards enhancing private sector participation in national development by assisting small and medium scale entrepreneurs to operate in that sector, thereby encouraging private sector enterprise and job creation, (Ansah, 2007)
In 1983, the Economic Recovery program (ERP) was introduced, the main objective of the ERP was to control inflation and promote private investment among others. To stimulate local production, duty rates on basic raw materials and capital goods were reduced in 1985. Within this same period, the government published a new investment code to affirm its commitment to a mixed economy. The financial sector was also liberalized to ensure adequate credit to the private sector. In an attempt to counteract inflation, the monetary authorities resorted to constant introductions of new Bank of Ghana rediscount rates and revision of reserve requirements, resulting in variability in credit flows and undermining the private sector’s confidence in the banking system.

Consequently, in line with the quest to promote a more vigorous private sector, the government went further to streamline the legal and administrative framework for the private sector and also made improvements in the financial and incentive framework. Other measures in the 1990s included the abolition of the manufacturing Industries Act, 1971 (Act 356), which removed a redundant and bothersome requirement in the investment establishment process and the repeal of a number of price control laws which did not permit the manufacturers to price their goods according to the dictates of the market forces. Furthermore, the Investment code, 1985, (PNDCL 116) was amended and the Ghana Investment Promotion Centre was transformed from a regulatory body to a promotional one.

Another development worthy of noting within this period was the conversion of the sales tax into the Value-Added Tax (VAT) at a flat rate of 12.5 percent from 15 percent. The broad coverage and relative neutrality of VAT made it an appealing tax scheme for most economists. The neutrality stemmed from the exemption given to export and investment
goods. Despite these measures private investment was still low because the perception of uncertainty in the political and economic environment persisted, Killick, (2002).

In July 2007, the Venture Capital Trust Fund (VCTF) was launched. The VCTF was established by Venture Capital Trust Fund Act (Act 680) which was promulgated in November 2004, with the objective to provide Investment Capital to Small and Medium Enterprises (SMEs). Further, to provide low cost financing to businesses so they can grow, create wealth and jobs. The vision of Government is that the scheme enriches businesses with enough resources to create jobs. Consequently, with enough wealth and jobs created, government revenues would increase (through taxes) and ultimately add to the pool of funds available to be down-streamed to businesses for investments.

In the Ghanaian economy, more than 90% of the companies are SMEs, Government in its desire to support this vital sector of the economy established the VCTF. This is because the SMEs are important area that needs easy access to finance. The SMEs create a suitable livelihood for the majority of the population supporting them is therefore vital for economic growth. Unfortunately, there is a dearth of long term investment funds for SMEs (as a consequence of the banks and other creditors shying away from the high risk investments in these sectors), it has became imperative for the Government to set up a venture capital fund that will provide long term funding for the high risk investment needs of the SME sector. Thus, VCTF is to support SMEs to get increased access to credit at a cheaper cost so that they can grow their business. The funds provided by the VCTF to businesses may come as an equity investment or loan and a combination of both loan and equity. If the funds are given as Equity, the Venture Finance Company becomes a partner or shareholder of the investee company and no debt service is charged, however, the Venture Finance Company gets annual
dividend from time to time. If a loan is granted by VCTF to a company, it is on a long term basis so that there is no immediate debt service that constraints the business. In most cases loans granted by VCTF carry an interest rate that is below the market rate or what the normal financial (banking) institutions offer. The VCTF thus, provides an opportunity to businesses that is almost not available elsewhere.

The Venture Capital Trust Fund has established joint venture with financial intermediaries to assist SMEs, raise capital at a cheaper cost and or provide long term low cost financing to businesses. Hence the VCTF slogan: “with Venture Financing, you have a Long Term Partner”. In addition, the purpose was to initiate relevant activities for the development and promotion of the venture capital industry in the country. This is because the Government vision of promoting the private sector as the engine of growth cannot be fulfilled without the effective functioning of financial intermediaries.

The Fund's source of funding is an amount of money equivalent to twenty-five percent (25%) of the proceeds of the National Reconstruction Levy. The Trust Fund monies are made available to investee companies through intermediary institutions called Venture Capital Finance Companies. The fund is available to all sectors of the economy except imports to sell and construction works like hotels. However, based on the Government's economic development goals and agenda, the Board from time to time will select certain sectors of the economy as priority, for a greater percentage of funding (about 55%) to be allocated. Currently, the priority sectors identified by the Trust Fund are Agriculture, Pharmaceutical, ICT and Tourism, (Venture Capital Trust Fund Act (Act 680); www.google.com).
At the international front, Ghana, has instituted measures aimed at improving the investment climate in the country. As a member, Ghana ratified the convention establishing the Multilateral Investment Guarantee Agency (MIGA) in 1988. MIGA aims at encouraging equity investment and other forms of FDI in developing nations, by reducing non commercial risk. Moreover, the government has entered into bilateral Investment Promotion and Protection Agreements (IPPAs) with a number of countries to further enhance the protection and security of the investment environment.

The government has a larger potential market for investors as a member of the ECOWAS which comprises of 16 countries with a population of over three hundred (300) million. Overall development partner coordination in Ghana is strong. Adoption of the Ghana Poverty Reduction Strategy (GPRS) by the Government of Ghana in 2002 created the momentum for a group of donors to align their assistance under a common Multi-Donor Budgetary Support (MDBS) framework in June 2003. The World Bank's strategy in Ghana lays emphasis in deepening its collaboration with other development partners through the MDBS framework, through sector programmatic support (e.g. in the health sector, HIV/AIDS, private sector, financial sector and public sector reform), and through joint collaboration on country analytic work, fiduciary assessments and mission management. The Ghana portfolio is wide-ranging and is aligned on GPRS/GPRS 11 pillars and desired outcomes.

The International Finance Corporation (IFC) is the private sector development arm of the World Bank. IFC promotes sustainable private sector development primarily by: financing private sector projects in developing world; helping private companies in developing world mobilize finance in international financial markets; and providing advice and technical assistance to businesses and governments. IFC's strategy in Ghana includes supporting
private provision of infrastructure, building and deepening the domestic financial sector, expanding financing and technical assistance support to SMEs, promoting the development of non-traditional exports and enhancing the business environment and investment climate.

In 2004, the IFC launched four (4) new technical assistance programs through the Private Enterprise Partnership for Africa (PEP Africa) in Ghana: the SME Enterprise Development Initiative, the Ghana Leasing Program, the Ghana Housing Finance Program and the Ghana Private Schools Support Program. Moreover, the IFC-supported Africa Management Service Company (AMSCO) continues to provide management expertise and capacity building to SMEs in Ghana.

By 2008, these measures had begun to yield positive results, with private investment recording relatively higher levels (from 3% of GDP in 1983 to about 7.2% of GDP in 2008). It is worth noting, however, that the average level of private investment is below the 15% minimum proposed by Gillis et al. (1987) and a high percent of 25 by Killick (1978). On the whole, it is obvious that the effort pursued were impressive, for private sector investment, which has shown improvements and also remained relatively stable, though not high enough to make the sector the engine of economic growth.
3.0 Introduction

In this chapter literature on investment, private investment and cost of financing as well as other related concepts are reviewed. The literature review forms the basis upon which the methodology and data analysis were carried out.

3.1 Theoretical Literature

The theoretical literature on investment is rich and wide-ranging. Investment is the flow of output in a given period that is used to maintain or increase the capital stock in the economy. Investment plays a crucial role in models of economic growth. It is an essential component of aggregate demand hence fluctuations in investment have considerable effect on economic activity and long term economic growth. While theoretical growth models developed in the economic literature makes no distinction between private components of investment, there is an emerging appreciation that private investment is more efficient and productive than public investment. This point to the fact that private and public capital investment contribute to aggregate production in different ways. Specifically, private investment contributing more than public investment stem from the premises that some public investment provides public goods and services to the private sector. The benefits from public investment contribute to the general well being than contributing to the productive capacity.

Thus investment in an economy is composed of public and private sector investment. Public investment refers to investment by the government sector primarily, but not exclusively, in the
areas of social and economic infrastructure. Private investment refers to investment by private businesses for the purpose of profit generation. Domestic government and citizens or foreign governments and citizens can own both public and private investment. Investment at any given time in an economy can also be divided into domestic investment and foreign direct investment (FDI). Investment can be in the form of fixed business investment (buildings, equipments, real estate); current investment (inventory); changes in business investitures (installation, inaugurations) or in financial assets such as stocks and other securities. Some of these investments are of short-term duration while others are of long-term duration. Investment projects with long-term horizons generally require long-term financing.

The theories of investment date back to the days of John Maynard Keynes. Keynes (1936), was the first to call attention to the concept (existence) of an independent investment function in the economy. A central feature of the Keynesian analysis is the observation that although savings and investment must be identical ex-post savings and investment decisions are in general taken by different decision makers and there is no reason why ex-ante savings should equal ex-ante investment. He considered investment as a function of the prospective marginal efficiency of capital in relation to a given level of interest rate reflecting the opportunity cost of the invested capital. He argued that investment is worth undertaking if the present value of the future income stream from a given level of capital investment is equal to or greater than the initial cost of capital. Furthermore, he pointed out the intrinsic volatility of private investment as a consequence of the underlying uncertainty associated with the expected returns on investment. Accordingly, he considered the decision to invest as based on what he referred to as the “animal spirits” of the investors rather than on the rational calculation of an inherently uncertain distant future. Investment theory has been in rapid evolution after Keynes' original formulation. The practice of macroeconomic adjustment, reforms and
growth have added other determinants considered relevant to better understand investment decisions.

The next phase in the evolution of investment theory gave rise to the accelerator theory. The accelerator models of investment have their origin in the works by Chenery (1952) and Koyck (1954). The models generally take the empirical form of the linear relation of current net investment to current and past changes in output. The naïve accelerator theory of investment posits that investment responds to changing demand conditions. It postulates a linear relationship between investment and output. The basic assumption of the model is that the desired capital stock at any point in time is a constant multiple of output at that time. That is $K^* = \alpha Y$, where $K^*$ is the desired capital stock, $\alpha$ is a constant multiple of output and $Y$ is output. In the naïve accelerator model, expectations, profitability and capital cost play no role in the determination of investment. The theory is based on stable optimal capital-output ratio.

According to the theory, as output exogenously increases, firms immediately raise their capital stock, that is, invest sufficiently to ensure that the capital-output ratio remain unchanged. Hence given an incremental capital-output ratio, it will be possible to calculate the investment level required to achieve a given targeted level of output growth. The problems with this theory are its simplistic assumptions that there is a fixed ratio of desired capital stock to output and the unrealistic assumption that the capital stock instantaneously adjusts to its optimal level, failing to recognize the high cost of adjustment and the time lag necessary for acquiring capital goods. Keynesians have traditionally favoured the accelerator theory of investment while disregarding the role of factor cost.
Following the limitations of the naïve accelerator theory, the flexible accelerator theory emerged. The naïve accelerator theory was modified to what became known as flexible accelerator principle of investment. A more general form of the accelerator model is the flexible accelerator model. The basic notion behind this model is that the larger the gap between the existing capital stock and the desired capital stock, the greater a firm’s rate of investment. Unlike the naïve accelerator theory, the flexible accelerator theory postulates that firms do not instantaneously adjust their existing capital stock to the desired capital stock because of uncertainties and various adjustment costs. Rather, what happens is that once a ‘shock’ to output occurs, firms gradually adjust their level of capital with the aim of re-establishing the optimal capital-output ratio.

The theory therefore asserts that the gap between the existing capital stock and desired capital stock determines investment. The larger this gap, the greater the firm’s rate of investment as firms attempt to close the gap in each period. Consequently, the net investment equation could be formulated as: \( I = \delta (K^* - K_{-1}) \), where \( I \) represents net investment, \( K^* \) is the desired capital stock, \( K_{-1} \) denotes last periods capital stock and \( \delta \) is the partial adjustment coefficient, which shows how fast the gap \( K^* - K_{-1} \) will be closed. A large coefficient of adjustment depicts a faster pace of closing the gap between desired capital stock and the actual stock. In the flexible accelerator model, output, internal funds, cost of external financing and other relevant variables are included as determinants of the desired capital stock. The model may be transformed into a theory of investment behaviour by adding a specification of desired capital stock and a theory of replacement investment.

However, alternative econometric models of investment behaviour differ in the determinants of desired capital stock, the characterization of the time structure of the investment process,
and the treatment of a replacement investment (Asante, 2000). While desired capital stock is proportional to output in the flexible accelerator model, the desired capital stock, in the alternative models depends on capacity utilization, internal funds, the cost of external finance and other variables (ibid).

The neoclassical theory of investment (version of the flexible accelerator theory), which was pioneered by Jorgenson (1963, 1967, 1971), postulates that output levels and user cost of capital are the key determinants of investment. In this approach, the desired or optimal capital stock is proportional to output and the user cost of capital. The user cost of capital in turn is determined by the price of capital goods, the real rate of interest, depreciation rate and the tax structure (Asante, 2000). In the neoclassical theory, the firm is assumed to reach an equilibrium level of capital stock when the value of the marginal value product of capital equals its user cost.

The neoclassical investment theory suggests that the growth rate of real GDP positively influences private investment (Wai and Wong, 1982; Greene and Villanueva, 1991; Fielding, 1997). Also the theory posits that private investment is negatively related to interest rate as high interest rate is believed to discourage investment by raising user cost of capital. The neoclassical model of investment is based on the assumption of perfect capital market and little or no government intervention. These may hold for developed countries but for developing countries, these assumptions are unrealistic as financial markets in developing countries are characterized by imperfections. Imperfection in the credit markets is believed to prevent firms from borrowing as much as they wish, thereby constraining investment.
Against this background, in the early literature of financial liberalization, another approach
dubbed “Neoliberal” (Galbis, 1979:423), emerged. The proponents of ‘Neoliberal’ theory
(McKinnon, 1973 and Shaw, 1973) emphasized the role of financial liberalization in savings
mobilization to stimulate economic growth. Thus they emphasized the importance of financial
deepening and high interest rates in stimulating growth. They argued that developing
countries suffer from financial repression (which is generally equated with controls on interest
rates in a downward direction). Liberalizing interest rate mainly by allowing market forces to
determine real interest rates would therefore exert a positive effect on growth rates as interest
rates rise toward their competitive market equilibrium. They claimed that administratively-
determined interest rates reduces savings, capital accumulation and discourages the efficient
allocation of resources.

The “Neoliberal” approach therefore holds the view that investment is positively related to the
real rate of interest. This view provides a direct contrast to the neoclassical school, which
hypothesizes a negative relationship between investment and real interest rate. The rationale
behind this view is that a rise in the interest rate will stimulate the level of financial savings
through financial intermediaries and therefore increases the level of investible funds. This
phenomenon by which the volume of investment could be raised via the resultant increase in
the level of investible funds made possible by a rise in the rate is what McKinnon referred to
as the “conduit effect”. Thus, while it may be true that demand for investment declines with
the rise in the real rate of interest, realized investment actually increases because of the
greater availability of funds. This conclusion applies only when the capital market is in
disequilibrium with the demand for funds exceeding supply.
Another strand in the literature on investment is the disequilibrium approach to investment. “Disequilibrium approach of investment” has its origin in the works of Malinvaud (1982) and Sneesens (1987). Here, investment is a function of profitability and demand conditions. According to Malinvaud, investment decisions can be divided into the decision to expand the level of productive capacity and the decision concerning the capital intensity of extra capacity. Whilst the former depends on the degree of capacity utilization in the economy reflecting demand conditions, the latter is dependent on the relative cost of capital and labour. Serven and Solimano (1992) considered the distinction between the aforementioned two main investment decisions relevant because of the assumption of a putty-clay technology, so that factor proportions are flexible ex-ante but rigid ex-post. This means that the proportions in which inputs are combined before investment vary but fixed thereafter.

The importance of financial factors that are external to the firm was highlighted by Tobin. This became known as Tobin’s q. According to Larrain, et al (1993), the q ratio is the ratio of the cost of the acquisition of a firm through the financial market to the cost of acquiring the firm’s capital in the output market. In the “q” theory of investment (which is also in the neoclassical framework), the ratio of the market value of the existing capital stock to its replacement cost (the “q” ratio) is the main force driving investment. Tobin argues that delivery lags and increasing marginal cost of investment are the reasons why q would differ from unity. In this theory, the catalyst of investment is the ratio of the stock market valuation of existing capital asset to its replacement cost. This is the “q” ratio. In accordance with Larrain et al definition, q>1 implies that the desired capital stock is greater than the actual level of capital, meaning that the market value of the firm exceeds its cost. If q<1, the reverse holds. So as long as q>1, the firm must continue investing until q=1.
The cash flow approach to investment (Duesenberry, 1958), provides a more general framework which incorporates financial conditions that are internal to the firm. According to this approach, investment is affected by the availability of internal funds, which in turn depends on profits. The view is that internal funds could be less costly than external finance if the market for borrowed funds is imperfect, perhaps due to difference in information about the riskiness of new investment. Larger amounts of internal funds might therefore lower financing cost and increase investment demand.

More recent literature has introduced an element of uncertainty into investment theory due to irreversible investment (Pindyck, 1991). The argument is that since capital goods are often firm-specific and has a low resale value; disinvestment is more costly than positive investment. He argues that the net present value rule of investment, when the value of a unit of capital is at least as large as its cost must be modified when there is an irreversible investment because when an investment is made, the firm cannot disinvest should market conditions change adversely. This lost option value is an opportunity cost that must be included as part of the cost. Accordingly, "the value of the unit must exceed the purchase and installation cost, by an amount equal to the value of keeping the investment option active" (Pindyck, 1991: 1112). The theory of investment irreversibility suggests that the cost of investing in machinery and equipment is usually not recovered by a future resale. (Acosta and Loza, 2005). Three major sources of uncertainty have been identified: unstable macroeconomic environment, unstable policy environment and external shocks.
3.2 Theories of Firm Investment Behaviour

Economic theorists are of the view that the firm under assumptions of rational behaviour will continue to invest until the marginal yield on physical assets are equal to the market rate of interest, which derives from two criteria in rational decision-making-profit maximization and market value maximization and are assumed to yield similar conclusions under certainty. Under the profit maximization criterion it is only worthwhile to acquire an asset if the asset will contribute to increases in net profits to the owners of the firm. Thus, managers seek to maximize the value of the firm and therefore seek to achieve optimum use of financial resources in order to maximize shareholder wealth. On the other hand, under the market value maximization criteria, an asset is worth acquiring only if it increases the market value of owners equity. In a nutshell, a firm acting rationally would invest until such a point that the expected rate of return on the asset exceeds the cost of the asset, (Bodie, et al (2007).

Additionally, economic theory states that investors base their investment decisions on the present value of an investment project. This involves the calculation of the present value of the income stream associated with the investment project and comparing it with the cost of the project. Due to uncertainty associated with an investment project this process is difficult. The process involves the estimation of the income stream based on year by year estimates of the increase in output associated with the increase in productive capacity, the price or prices at which the additional output can be sold and the operating costs associated with the project. Net income is found by subtracting the operating costs from the revenues associated with the project. The prospective investor uses the net income stream to determine its present value. The present value is then compared with the cost of the project. If the present value associated with the project is greater than its cost, the rule is that, the investor should undertake the
project. If on the other hand, the present value is less than the cost, the prospective investor should not undertake the project. The market rate of interest plays an important role in the investment decision process. The interest rate is used to discount the future income stream associated with the project. The present value of the future income stream is then compared with the cost of the project in order to make the investment decision. Any change in the interest rate alters the present value of the income stream. The result is that an investment project could be profitable at the old interest rate but unprofitable at the new rate or vice versa. Thus investment largely depends on the market interest rate.

An alternative investment decision-making process is the comparison between the marginal efficiency of investment and the market rate of interest. The marginal efficiency of investment is the rate of interest, which equates the cost of the project and the discounted value of the future income stream associated with the project. The marginal efficiency of investment is often referred to as the internal rate of return. The decision of the investor in this case is based on the comparison of the marginal efficiency of investment with the market rate of interest. If the marginal efficiency of investment is less than the market rate of interest, the investment project is unprofitable or at least, less profitable than lending the money at the market rate of interest. Thus the investor should not undertake the project. On the other hand, if the marginal efficiency of investment is greater than the market rate of interest, the investment project is profitable or at least, more profitable than lending the money at the market rate of interest. The market rate of interest plays a significant role in the investment decision making process.

A project is unprofitable if the interest rate is too high. The project is however, profitable if the interest rate is sufficiently low. The market interest rate therefore, strongly determines
whether an investment should be undertaken or not. There is an inverse relationship between investment and the market interest rate, (Brealey and Myers, 2007).

An explanation is offered by Goyal and Yamada (2004) that under tight monetary policy interest rates generally rise and overall financial conditions become tight. Goyal and Yamada (2004) observed, macroeconomic factors have a significant effect on the cost of external financing and the severity of financing constraint faced by the firm determine their investment level. Myers and Majluf (1984) showed that external capital is more costly than internal capital. Consequently, firms that require more external capital relative to internal capital will have lower investment; there is a direct relation between capital costs and investment levels. Moreover, firms that we claim have higher costs of accessing external capital (e.g., small firms) have a higher sensitivity of investment to volatility.

Investment decisions are also often based on the nature and timing of investments. According to Pindyck, (1991 ) and Pattillo (1996), an important aspect of investments is that most investments are irreversible. This implies that, such investments involve sunk costs that cannot be recovered. Investment expenditures are sunk cost and therefore irreversible because most often, the capital is firm or industry specific and cannot be used by a different firm or in a different industry. Certain investments may not be firm or industry specific but are often partly reversible because of what is referred to as the “lemons” problem. In such instances, a newly purchased equipment, for example, vehicles and computers are not industry specific but their resale value will be less than the purchase cost, even if new. Irreversibility in investment can also be created by government regulations or institutional arrangements.
Another factor, which can affect investment decisions when the investment is irreversible, is the possibility of delay of the investment. When this possibility exists, it makes it possible for firms to wait and take advantage of information about prices, costs and other market conditions before taking investment decisions. However, firms do not always have the opportunity to delay investments. This happens when strategic conditions compel a firm to invest quickly in order to prevent other competitors from doing so. Delay of an investment is however, important in most cases. The ability to delay irreversible investment expenditure can to a very large extent, affect investment decisions. When investments are irreversible and can be delayed, they become sensitive to uncertainty to delay investments. This happens when strategic conditions compel a firm to invest quickly in order to prevent other competitors from doing so.

The poor performance of private investment in Africa has been attributed to uncertainty and instability (Anita and Morisset, 1993; Serven, 1997). Firms may be uncertain about future prices and wages, or they may be uncertain about future productivity. The source of uncertainty may be changes in consumers’ tastes, technology, or institutions. Macroeconomic uncertainty variables that include the variability of inflation and the real exchange rate have been determined as significant deterrents of private investment. Other measures of macroeconomic instability that affect private investment include the variability of the government deficit and variability of external debt. Another source of uncertainty that affects private investment is political instability, Aryeetey, (1994).

Fazzari. et al (1988) noted that investment is essential for long-run growth, and it plays a central role in engendering the course of the business cycle providing a semblance of the theoretical link between macroeconomic factors and firm investment behavior. It is generally
argued that financing constraint of the firm is linked with the real economy because such constraints are exacerbated under periods of recession and monetary contractions. Fazzari et al. (1988) observed that financing constraint effect is more pronounced during recessions when cash flow is low and the value of collateralized assets are equally low as well. In addition, other researchers have concluded that in recessions firms facing liquidity constraints are more likely to cut investment in inventory.

The growth of private investment in developing countries is important for the success of macroeconomic policies. The fact is that if firms are not sure about the success of macro policies, they will be afraid to invest. When they fail to invest, then macro policies are in fact, doomed to fail. It is therefore clear that investment depends on risk factors that are at least partly under government control like price, wage and exchange rate instability, the threat of price controls or expropriation and changes in trade regimes. Most macroeconomic policy variables – interest rates, inflation rates and exchange rates are prices. It has been observed that countries that enjoy relatively high growth rates are those that have managed to avoid significant rates, keeping interest rates and the price of capital positive in real terms, avoiding high inflation and avoiding real wage increase that are not justified by rising productivity, also enhanced investment activities as well, (Dixit and Pindyck, 1994).

3.3 Cost Factors and Private Investment:

3.3.1 Interest Rate

The relationship between interest rates and investment as portrayed by theory are varied and ambiguous when looked at as a whole. The marginal productivity of capital are determined by productivity and thrift, thus for any given profitability level, investment expenditure varied negatively with interest rate, implying firms rate their investment projects in order of the
expected profitability, net of the cost of borrowing the funds to finance these projects. At a higher interest rate therefore, the net profit of most projects will be lower or even negative thereby discouraging potential investors from investing. Symmetrically, at a lower interest rate level, more projects will become profitable, encouraging investors to invest more. Empirical tests have been less successful in establishing a robust negative relationship between the interest rate and investment. Neoclassical theory suggests that high interest rates raise the cost of capital, which reduces the investment rate.

However, McKinnon (1973) and Shaw (1973) suggest that there could be positive relationship between investment and real rate of interest rate, because higher real rate of interest would increase savings, volume of domestic credit will increase as a result, and equilibrium investment will be higher. This hypothesis, known as McKinnon and Shaw hypothesis, is based on assumption that quantity of financial resources is main constraint on investment rather than cost of funds. In most African economies, nominal interest rates are high but real rates are often negative due to high inflation rates. In such a context, the interest rate can have a negative effect on investment only through the saving channel. Low or negative real interest rates discourage saving, which reduce the amount of funds available for investment.

### 3.3.2 Inflation Rate

Besides the factors derived from the neoclassical investment model, the domestic inflation rate has also been proposed as affecting private investment rates in developing countries, where inflation is less often correlated with a rise in economic output than in industrial countries (Dornbusch and Reynoso, 1989). High rates of inflation adversely affect private investment by increasing the riskiness of longer-term investment projects, reducing the average maturity of commercial lending, and distorting the information content of relative
prices. Also, high inflation rates are often considered an indicator of macroeconomic instability and a country's inability to control macroeconomic policy, both of which contribute to an adverse investment climate. Thus, the domestic inflation rate is negatively related to the rate of private investment.

Inflation also discourages long-term lending by financial intermediaries, which further reduces the investment rate. In general, inflation is an indicator of the quality of macroeconomic policy-making. Fischer (1993, p. 487) puts it as follows: "In essence, the inflation rate serves as an indicator of the overall ability of the government to manage the economy. Since there are no good arguments for very high rates of inflation, a government that is producing high inflation is a government that has lost control". Evidently, there is little incentive to invest in a country where the government has lost control over the macroeconomic environment.

### 3.3.3 Exchange rate

It is the rate at which domestic currency can be converted into foreign currency. As the exchange rate fluctuates, the domestic value of goods priced in foreign currency similarly fluctuates. One of the major reasons for the downward behaviour of private investment in the developing countries, including Ghana, is the overvaluation of the exchange rate. The consequence of the overvaluation of the exchange rate is that the demand for foreign currency far outweighed its supply. This creates scarcity, so that imports of basic needs such as inputs for investments like plants and machinery, gasoline and spare parts which are needed to supplement and stimulate investment, could not be brought into a country.
Aryeetey (1994) also observes that the rapid depreciation of the cedi has led to a general business uncertainty, which has inhibited the private sector investment needed to increase productivity. This ironically is at a time when the private sector development is seen as the prime mover of the economy. Massive frequent depreciation of the exchange rate has a direct implication for the cedi outlay required to import a given quantity of imported inputs such as raw materials, equipments or machinery. In this case, relying too much on imported raw materials implies that producers demand for working capital has to increase which might lead to a reduction in output. Asante and Addo (1997), indicated that production in the manufacturing sector was constrained by the limited availability of imported inputs in Ghana. This indicates that most of the firms in Ghana rely on imported inputs for their investment projects.

3.3.4 Government Budget Deficit

It is the difference between government spending and revenue. Any budgetary shortfall must be offset by government borrowing. Large amounts of government borrowing can force up interest rates. Thus, excessive government borrowing “crowds out” private borrowing and investing by forcing up interest rate, thereby choking off private sector investment. Stated differently, government consumption spending may crowd out domestic investment through a raise in interest rates, thereby reducing the pool of funds in the credit markets, and also by increasing distortionary taxation on investment activities.

It is also possible, however, for government spending to “crowd in” domestic investment through the accelerator channel. The net effect is theoretically unpredictable; it can only be determined empirically. Government borrowing from the domestic financial system is another factor that has reduced investment over the years. In most African countries, credit markets
are often regulated while the institutional environment establishes borrowing privileges for the central government and other government entities, which reduce private investors' access to credit (Collier and Gunning, 1999).

Moreover, like private borrowers, governments can be bad debtors, with a tendency to default on their loans due to budgetary problems or simply because of bad management. This increases the fragility of the financial system, which further depresses investment. Inefficient government policies also have resulted in consistently high and unpredictable inflation rates in many African countries. High and unstable inflation adversely affects investment by increasing the degree of uncertainty about the macroeconomic environment. This discourages firms from undertaking long-term and illiquid investment projects. The extent to which government deficits create a "crowd out" problem i.e., government borrowing which diverts savings that would otherwise be borrowed by private businesses to purchase new plant and equipment, into government hands, reduces the level of private investment. Crowd out theorists argue this competition between business and government for savings, forces interest rates up and substantially reduces the amounts business find profitable to borrow to invest, (Spencer and Yohe, 1970; Heim, 2007, 2008).

3.4 Non-Cost Factors and Private Investment:

3.4.1 Output (real GDP) Growth

Neoclassical investment theory suggests that the growth rate of real output is positively related to investment because it indicates changes in aggregate demand for output that investors seek to meet. Thus the Neo-classical investment theory suggests that the growth rate of real GDP influences private investment in a positive manner (Greene and Villanueva 1991, Fielding 1997). This is also known as the "accelerator effect". Theoretically, this relationship
can be derived from a flexible-accelerator principle with the assumption that the underlying production function has a fixed relationship between the desired capital stock and the level of real output. Empirical evidence is consistent with this accelerator effect and shows that high output growth are associated with high investment rates. (Fielding, 1997, 1993; Greene and Villanueva, 1991; Wai and Wong, 1982).

Similarly, in Jorgenson (1963), the value of the desired capital stock for a typical firm depends positively on the demand level. The output of a country (GDP) would be a reasonable proxy to aggregate demand as a determinant of private investment in a country. However, to reduce the risks of simultaneity basis, the GDP variable, either in levels or in percentage form, is specified with a one-period lag. Further, the growth rate lagged by one period could also be construed as a proxy for expectations about future demand for, and returns from, the output of investments.

In the same vein, private investment has been hypothesized as a positive function of income per capita. Greene J. and Villanueva D., (1991), affirmed that countries with higher per capita income (real GDP) could devote more resources to domestic savings, which could be used to finance investment projects. Real output (GDP) growth is key to investment boost in developing countries including Ghana. It has been suggested that private investment is positively related to the growth of real output. Nevertheless, "what determines investment" remains very much an open question in research on economic growth. Among the few recent studies on the subject is Blejer and Khan (1984), which examined the impact of government economic policy on private investment in some 24 developing countries. This study found that the level of private investment activity was positively related to the change in expected
real GDP, negatively to excess productive capacity (the shortfall of actual GDP from its trend value).

3.4.2 Public Investment

In developing countries, the public sector generally plays a large part in economic activity through public sector investment. The public sector investment may have “crowding out” or “crowding in” effects on private-sector investment. When the public sector invests predominately in infrastructure, public and private investment can complement each other. Hence, the relationship between public and private investment would be positive. In addition, if there is some slackness in the economy (e.g., the onset of the crisis), an increase in public investment can encourage domestic demand expansion, inducing an expansion of private investment. On the other hand, with limited physical and financial resources, an increase in public investment can “crowd out” private investment, thereby inducing a negative relationship.

Thus public investment activity may be complementary to and consequently support private investment, particularly where public investment involves useful infrastructure: transportation systems, schools, water and sewage systems, and the like. Projects in these areas tend to raise the expected rate of return on private investment. On the other hand, public sector investment may detract from private investment activity to the extent that it substitutes for or crowds out private investment. This may occur when the investment involves parastatal enterprises producing goods that compete with the private sector, or when heavy spending for public capital projects leads to high interest rates, severe credit rationing, or a heavier current or future tax burden (Aschauer, 1989). As identified by Tsikata et al. (2000), on their study on
the determinants of foreign direct investments in Ghana, electricity and water combined, were
listed by 82.1% of the respondents as posing an obstacle to foreign direct investments.

3.4.3a Stock Market

The stock or capital market offers a relatively cheaper source of obtaining funds for
investment projects. Capital markets are view as a medium to encourage savings, help channel
savings into productive investment and improve the efficiency and productivity of investment.
Therefore another important factor that affects the private sector investment is
underdeveloped capital markets and financial intermediation in developing economies.
Because of the absence of long-term financing and the futures market, bank loans and external
borrowing may be the only sources of credit available for private sector investment financing.

A well-developed stock market can help align the interest of owners and managers and
thereby spur efficient resource allocation and economic growth in an economy. Ghana’s
vision 2020 program recognized the private sector as the engine for economic growth, the
ability of the private sector to play this role more effectively as the engine of economic
growth will depend on the ease with which the private sector mobilizes long-term funds for
investment. This vision obviously can only be achieved by an effective and well developed
stock market.

In view of this the Ghana Stock Exchange (GSE), with eleven (11) listed equities and one (1)
debt instrument at it in caption in 1990, the number has grown to: equities- thirty five (35),
depository shares- one (1), preference shares- one (1), corporate bonds- three (3) and
government bonds- one hundred and fourteen (114) by the end of 2008. The value and
volume traded increased from GH¢m 0.0064 and 222 million in 1990 to GH¢m 365.51 and 531,660 million in 2008 respectively. By end of 2008, the GSE had total market capitalization of GH¢m 18,465.15. (Ghana Stock Exchange, Market Statistics, February, 2010). Consequently, the GSE was adjudged the best performing African Market and the World Best Performing emerging market in 1994, 1998 and 2003 by various stock market watchers.

Despite these remarkable achievements, studies have shown that the GSE is constrained by several factors, such as low income, lack of public awareness about the capital market, high treasury bill rates, the absence of underwriters and venture capital firms, among others. Further, there appear to be some sort of apathy on the part of local investors to get their companies listed on the exchange, apparently due to the general unwillingness of business owners to relinquish control of their companies, unwillingness to disclose certain vital information about their companies and the inability to meet the strict listing requirements of the GSE (Osei, 1998; Ziorklui et al, 2001).

3.4.3b Domestic Savings

Domestic savings is used as a proxy for the stock market variable, during the period when the Ghana Stock Exchange was not in existence. The work of McKinnon-Shaw (1973) offered a theoretical and empirical foundation for the relationship between monetary factors and investment. These authors advanced the hypothesis that investment in developing countries is positively associated with the accumulation of real money balances. The McKinnon-Shaw hypothesis is based on the assumption that limited access to credit in developing countries forces investors to accumulate enough real balances before they can initiate investment projects. This view establishes a positive relationship between real interest rate and
investment. Higher interest rates on deposits attract more real balances, which allow them to
finance more investment. This is in contradiction of the neoclassical view that higher interest
rates increase the user cost of capital and thus reduce investment. Evidence on this
neoclassical interest rate (relative price) effect is mixed at best.

Recent studies go beyond the McKinnon-Shaw tradition and relate investment to financial
development in general by emphasizing the special services that financial intermediaries
provide to investors. The financial system is key to matching financial resources to investors
needs both through short-term credit expansion and, through its maturity transformation
function, by channeling saving into long-term credit markets. Financial markets play an
important role in allocating investment capital to high return activities (Greenwood and
Smith, 1997). The emphasis on the role of finance for investment constitutes a major
improvement on the traditional view that domestic investment is primarily determined by
domestic savings.

Indeed a number of studies have documented a close connection between low investment
rates and low domestic saving in developing economies (Bayoumi, 1990; Dooley, Frankel and
Mathieson, 1987; Feldstein and Horioka, 1980). These studies find that countries with low
saving rates also have low investment rates. The positive relationship between domestic
savings and domestic investment is often viewed as evidence of imperfect international
capital flows and various country specific institutional and non institutional rigidities
(Feldstein and Horioka, 1980). Greene and Villanueva (1991) asserted that countries with
higher per capita income could devote more resources to domestic savings, which could be
used to finance investment projects.

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Private investment activity has been hypothesized as a positive function of income per capita because of the greater ability of higher income countries to devote large resources to savings. This ability is particularly important given the imperfection of capital markets, since it appears that most investment projects must be financed, at least in substantial part, through domestic savings. This approach that assumes, however, that saving directly causes investment has important limitations. First, this view is an equilibrium (static) approach. Second, this view only considers the real side of the saving behavior and regards saving as a residue of income after consumption. Pollin, (1997), it is more appropriate to consider saving as a financial phenomenon. Under this view, saving is regarded as a mechanism of supply of funds (directly and indirectly) to the capital markets that channel the funds into the investment process. In that sense, the financial sector benefits from positive externalities from the real sector through the volume of saving (Berthelemy and Varoudakis, 1994). However, Keynes (1973, p. 222) pointed out that investment is constrained not by low savings but by low credit supply: “The investment market can become congested through shortage of cash, it can never become congested through shortage of savings.

3.4.4 Credit to the private sector (funds availability)

Credit is defined as a means of facilitating the temporary transfer of purchasing power from one individual organization to another, Batterham and Majid, (1987). Many private enterprises in developing countries depend on credit to carry out their investment projects. Therefore access to credit as far as investors are concerned is an important factor since it provides external finance to investors. The issue of the allocation has a profound implication at the national level. When credit is allocated poorly, poor investment projects are undertaken and the nation’s resources are squandered.
There is the belief that adequate credit and other financial assistance channeled through investment in the private sector could propel the economy to achieving high growth levels. However, lack of access to finance is consistently cited in surveys as constraint to private sector investment in Africa countries. There is evidence of demand for external finance by enterprises that want to expand beyond the limits self-finance but have historically lacked access to credit (Aryeeetey et al, 1994). Undoubtedly, the limited flow of credit to entrepreneurs especially those in the productive sectors has serious adverse consequence on the macroeconomic performance of the country.

In Ghana, over the years, a large proportion bank credit has been directed towards fiscal deficit financing to the neglect of the private sector. Subsequently, by the end of year 2001, Parliament passed into law a Bank of Ghana Act (BOG Act 612). This Act gives operational independence to the Bank of Ghana making it independent of instructions from government or any other authority in the maintenance of price stability. Monetary policies from 2000 to 2005 were focused on creating conducive environment for accelerating growth and wealth creation by sustaining the progress made in reducing inflation and maintaining exchange rate stability prior to year 2002, (Bank of Ghana, Annual Bulletin, 2002-2005).

It is generally argued that it is sometimes the availability of capital rather than the cost of capital that determines the level of investment. A firm may have a good investment opportunity and yet it may have to give it up because the firm does not have access to enough financing in which case underinvestment arises. The consequence of unavailability of funds is that it makes firms unable to raise funds from outside parties to finance positive net present value projects either in the form of equity or debt, (Myers and Majluf, 1984). Thus the firm's
investment is restricted to internally generated funds. Also the reliance on internally generated cash flow is a sign of under investment if outside finance could be cheaper.

3.4.5 External Debt

The presence of large external debt burdens constitutes another source of uncertainty in the macroeconomic environment. A high external debt signifies that part of the future returns on any investment must be used to service the existing stock of debt. A higher external debt level could be an indicator of over-indebtedness of external credit for investment financing, signaling the lack of viability and sustainability of current macroeconomic policies in the long term, and most likely negatively impacting investors’ expectations due to the increase in the degree of uncertainty on future policies.

Foreign debt may affect private investment in several ways; first, the size and timing of external transfers to the country's creditors may be uncertain as it depends on future levels of world interest rates, terms of trade, the purchasing power of exports, and the ability to reschedule debt. Thus, the level of the real exchange rate and the timing of demand management policies consistent with the required transfer also become uncertain. Second, funds available for investment will be reduced where a higher debt service payment is involved. Third, many developing countries including Ghana, face liquidity constraints in international capital markets because of large arrears on debt service obligations.

Further, high debt can depress investment in various ways: first, high debt implies that a higher proportion of domestic output is used to meet debt obligations. This phenomenon, referred to as "debt overhang" (Krugman, 1988), creates a disincentive effect that discourages domestic investment. Second, high debt obligations adversely affect the country’s position in
international credit markets and can even cause credit rationing. The credit rationing effect can be important, especially for sub-Saharan African countries given their low domestic saving rates that force them to depend on foreign funds for investment. Credit rationing thus amplifies the debt overhang effect in reducing domestic investment. Third, high levels of external debt depress investment by making the macroeconomic environment more uncertain. Higher indebtedness increases the vulnerability of African economies to exogenous shocks, such as fluctuations in exchange rates and commodity prices, which can reduce the countries' ability to honor their debt obligations. Chronic trade deficits combined with ill-advised monetary and exchange policies have created a shortage of foreign exchange in sub-Saharan African countries.

Several studies have emphasized that a heavy debt overhang reduces the incentive to invest because of the anticipated foreign tax on future income and returns on investment. Empirical results have confirmed that high debt has a strong negative impact on the private investment rates in developing countries (Oshikoya, 1994). Further, studies on developing countries in general and on sub-Saharan Africa in particular find a negative relationship between external debt and domestic investment (Jenkins, 1998; Greene and Villanueva, 1991).

3.5 Empirical Literature

Empirical literature on the relationship between cost of financing and private investment as well as other related areas has been examined to validate the linkage between the dependent and independent variables.

Hubbard (1994) argues that a firm will want to suspend operations if operating costs cannot be covered. He assumed that, a project's operation can be costlessly ceased when the current
price is less than the operating cost and can be costlessly restarted if the current price rises above the operating cost. Hubbard noted two regions for the value of the project depending on whether the current price is greater than or equal to the operating cost or the current price is less than the operating cost.

The role of exchange rates, inflation rates and interest rates in investment decisions are important. Thus any uncertainty about real exchanges rates, inflation rates and real interest rates will have serious consequences for investment decisions. Dixit (1987) and Krugman (1988) noted that when sunk costs of entry are combined with uncertain exchange rates, firms are discouraged from entering the market even though current exchange rates would seem to make entry profitable. Ingersoll and Ross (1988); Tornell (1988), examined interest rate uncertainty in the context of irreversible investment where future returns are known with certainty. They found that there will be a great effect of interest rate uncertainty on the optimal timing of investment. Also an expected decline in future interest rates may not lead to increased investment because the change lowers the cost of waiting, so that the effect on investment is ambiguous. This means the volatility of interest rates may have a more important effect on investment than the actual levels of interest rates. Pindyck and Solimano (1993) also found that inflation appears to be a major cause of volatility; and strongly and negatively related to measures of investment performance.

Huizinga (1993) studied how inflation uncertainty affects investment decisions. He noted the uncertainty about the net present value of investment projects as the main tool for inflation uncertainty to influence investment. He observed that if higher inflation uncertainty raises uncertainty about the net present value of an investment project it can be in the firm’s best interest to delay undertaking the project until the uncertainty decreases or until the expected
payoff from the project increases enough to offset the higher uncertainty. Huizinga (1993) investigated the association of inflation uncertainty and uncertainty about real wages, real output price and profit taxes based on the premise that uncertainty about these variables contribute in an important way to uncertainty about the net present value of an investment project.

Hadjimichael and Ghura (1995) carried out an empirical analysis on private investment performance of thirty-two (32) African countries over the period 1986 to 1992, using a specification that includes the variability of inflation and the real exchange rate as measures of economic uncertainty, and an index of political and civil liberties as proxy for the definition of property rights. Their estimation results showed that either measure of macroeconomic uncertainty has a strong adverse impact on investment, while the political variable had a positive but insignificant effect. Ghura and Greenes (1993) had similar results when they studied the macroeconomic performance in thirty-three (33) sub-Saharan African countries during 1987 to 1992. They found that real exchange rate volatility has a strong adverse impact on the (total) investment/GDP ratio.

Asante (2000), in a study to analyze the determinant of private investment in Ghana for the period 1970-1992, using times series analysis, cross sectional analysis and the ordinary least square (OLS), came out with the findings that the overall measure of macroeconomic instability has been a major hindrance to private investment; credit to the private sector has a positive and significant effect on private investment; public investment was complementary to private investment; military takeovers created a climate hostile to private investment whilst the real GDP growth showed a positive sign in all the trials. Based on the findings, recommended that policies that address only some components of macroeconomic instability
may not be enough to revive private investment; the question of cost of finance must therefore be properly address in order to attract participation of private sector in investment, also there is the need for government to continue to develop the infrastructural base of the economy to boost the private sector. It is clear from the survey that lapses and hindrances to the private investment need be given serious attention if the private sector is to stand as the “engine of growth” in the Ghanaian economy.

Aryeetey (1994) concluded that the poor growth in private investment in Ghana might be attributed to the perception of uncertainty in the political and economic environment since 1982. He observed that the uncertainty is derived from the low credibility of government, as it has been unable to assure investors that earlier decisions that showed a bias against private wealth will not be repeated. Private investment impacted by macroeconomic variables like real exchange rates and interest rates were identified as important to investment decisions.

Solimano (1989), in his paper on how private investment reacts to changing macroeconomic conditions in Chile, showed that the volatility of the real exchange rate has a significant negative effect on private investment. He found that the large swings in the real exchange rate and output in the 1980s may have reduced private investment as compared to the situation of lower variability of relative prices and output. Serven and Solimano (1993) investigating the role of some factors in the observed performance of investment in developing countries using a pooled cross-section-time series data for a group of fifteen (15) developing countries found that inflation instability index and the real exchange rate instability index (measures of instability) had negative impact on private investment. They noted that, though their individual significance is not about five (5) per cent level, taken together, they are significant.
Khan and Reinhart (1990), using relatively smaller sample and narrower time periods in their cross-country studies, estimated a model for 24 developing countries and found private investment has a larger positive impact on growth than public investment. They recommended that government should aim at an enabling environment for the private sector in their endeavor to promoting sustainable long run economic growth which can eventually raise the standard of living of the population.

Ang James (2006) explored the determinants of real private investment for Malaysia, using time series data for the period 1960-2003. Variables used included user cost of capital among others. In the analysis, use was made of a private investment model drawn on the Neoclassical framework and found a robust long run co-integrating relationship between private investment and all its determinants. Consistent with the predictions of the neoclassical model, higher cost of capital retards private investment whilst higher level of output raises private investment. This implies that cost of borrowing is very important in making investment decisions.

Badawi (2003) in investing the impact of macroeconomic policies on private investment on Sudan and employing annual data over the period 1969-1998, he focused on public investment credit, devaluation and interest rate policies. He used co-integration, vector autoregressive and error correction techniques to estimate long and short run coefficients. The results suggest that public sector investment had a negative crowding out impact over the period of study. Devaluation policy also contributed to discouraging private sector capital expansion. Monetary policy in the form of restricting domestic credit appears to have had a significant impact on private investment. Increase in interest rate has been deleterious to private investment, indicating that costs of funds did matter for private investors in Sudan. In
general the effect of interest rate on investment has been studied mostly within the notion of financial liberation (Morisset, 1991).

3.6 Conclusion

Various studies reviewed found financing cost factors to have negative and significant impact on private investment. Most of these studies although carried out outside Ghana, except Asante (2000) and Aryeetey (1994), support the view that cost of financing is essential for private sector investment participation. Unlike Asante, Aryeetey and others, this study specially, looks at the extent of influence of financing cost on private investment. While the focus is on private sector cost of financing, which appears the major problem of private investors, it needs to be proved as a sufficient condition in this regard since investors operate under different conditions in different countries.
CHAPTER FOUR
RESEARCH METHODOLOGY

4.0 Introduction

The methodology details the approach and strategy adopted to achieve the objectives of this empirical research. It details the types and the sources of data used, the model used, the major criterion for accepting the econometric results and the econometric techniques of estimation.

4.1 Research Approach and Strategy

Following the research work done by Asante (2000); Seruvatu and Jayaraman (2001) and others, it is clear that private investment depends on three broad categories of variables: Keynesian, neoclassical, and uncertainty variables. Variables that may be included in the Keynesian tradition include growth rate of GDP (output growth), internal funds and capacity utilization. The neoclassical determinants of private investment include Tobin’s Q, real interest rate, user cost of capital and public investment. There are three uncertainty variables; the first is variability of the user cost of capital (real interest rate, real exchange rate, inflation rate, distortions in the foreign exchange market) and real GDP. The second uncertainty variable is the debt/GDP ratio and the third is debt service as a ratio of exports of goods and services. Hence the determinants of private investment would be specified as consisting of Keynesian, neoclassical and uncertainty variables. In general private investment is a function of output, cost of capital, and adjustment coefficient (Jongwanich and Kohpaiboon, 2008).

Unlike other estimations, the model estimated here includes cost variables and non-cost variables as control variables.
4.2 Variables Used

This research investigates the impact of cost variables or factors on private investment in Ghana, controlling for non-cost variables or factors of private investment. The hypothesized investment function which has been examined in this study has Private Investment (PINV) as the dependent variable whilst the independent variables have been grouped into Cost variables and Non-Cost variables. Cost variables are defined to mean factors that affect the cost of credit directly. According to the businessdictionary.com, financing cost: in general means, price of obtaining debt (loans and bonds) and equity (common stock) capital. Also, according to Baum and Tolbert (1985), interest, inflation, exchange rates among other macroeconomic variables are price. According to Jongwanich and Kohpaiboon (2008), the user cost of capital can be grouped into three- Interest rate, depreciation and the price of obtaining the capital stock. Subsequently, the investment function which was examined in this study has the following cost variables:

i. Interest rate (INTR)

ii. Inflation rate (NFL)

iii. Exchange rate (EXR)

iv. Government Budget Deficit (BD)

Whilst Non-Cost variables: include other factors that affect private investment aside the cost variables. Therefore the non-cost components of the investment function are as follows:

i. Public or Government Investment (GI)

ii. Stock Market (Proxied by domestic savings for 1970-89) (SM)

iii. External Debt (EXD)

iv. Credit to private sector (Availability of credit) (CPS)

v. Real Gross Domestic Product (Output growth) (RGDP)
4.3 Justification of Independent Variables:

i **INTR = Interest rate**

Keynes notes that "investment will be pushed to the point on the investment schedule where the marginal efficiency of capital is equal to the market rate of interest" (Keynes 1973; page 136-137). In this model, the interest rate used is a year-on-year of the annual percentage interest rate produced by the Bank of Ghana, which is the lending interest rate charged by commercial banks. High lending rate has been a major impediment to investment. According to the neoclassical theory, interest rate is expected to have negative influence on investment. However, McKinnon (1973) and Shaw (1973) suggest that there could be positive relationship between investment and real rate of interest, because higher real rate of interest would increase savings, volume of domestic credit will increase and as a result equilibrium investment will be higher.

ii **NFL = Inflation rate**

The rate at which general prices of goods and services change over time has been a very relevant variable that determines financing cost of investment. Inflation is believed to be an important factor that influences investment decisions in any economy. Inflation pressures raises interest rate and relative instability in foreign exchange rates. Furthermore, this may result into change in real income of the economy as a whole, thus altering the production capacity. In this model, the rate of inflation (measured by consumer price index) will be included. Inflation rate is expected to have negative influences on investment. Pindyck (1991), rising inflation is a major cause of price uncertainty in an economy. It is therefore expected to have an inverse relationship with private investment.
EXR= Exchange rate

It is the rate at which domestic currency can be converted into foreign currency and vice versa. The exchange rate used in this study is the cedi / dollar rate from Bank of Ghana. As the exchange rate fluctuates, the domestic currency value of goods priced in foreign currency similarly fluctuates. The exchange rate influences the relative prices of foreign and domestic investment of goods and services, and which, when rising, augment total purchasing power of business income (Heim, 2008). The effect of the exchange rate on private investment is hazardous; Chibber and Mansoor (1990) argue that a real depreciation acts as an adverse supply shock in the “production” of investment goods. A change in currency value changes the real costs of purchasing imported capital goods, the profitability of the private sector is affected and possibly causing investment to retard. The exchange rate is therefore expected to have negative influence on investment.

BD= Government Budget Deficit.

The government budget deficit that is the difference between government spending and revenue (Taxes less Government Expenses) creates a ‘crowd-out’ problem (Heim, 2008). Any budgetary shortfall is offset by government borrowing. Large amounts of government borrowing forces up interest rate by increasing the total demand of credit in the economy. Excessive government borrowing crowds out private borrowing and investing by forcing up interest rates and choking off private sector investment. Thus, deficit spending finance through bank borrowing causes interest rate to go up hence increasing the cost of funds available to the private sector and as well leads to credit rationing and increased tax burden. Consequently, private investment is expected to be negatively related with the budget deficit.
GI = Government or Public Investment

Government or Public sector investment has been found to affect private investment, although its impact remains ambiguous. For instance public investment can boost private investment by increasing private returns through the provision of infrastructure (Communication, transports, energy, etc.). Conversely, public investment may crowd out private investment if the public expenditure was made in especially non-developmental programs such as on defense and debt servicing. Hence it can impact private investment in either ways.

SM = Stock market.

Keynes again notes that “the daily reevaluations of the Stock Market inevitably exert a decisive influence on the rate of current investment” (Keynes 1973; page 151). All things being equal if the evaluation reveals a better performance, investment is expected to increase. This study used the Ghana Stock Market All Share Index to measure reevaluation of the stock exchange. Further, the study used domestic savings as a proxy for the stock market all share index. This is as a result of unavailability of data on the all share index from 1970 to 1989, when the GSE was not in existence. The stock market variable is expected to have a positive impact on private investment.

EXD = External debt.

A further impediment to private investment is external debt of the nation. High debt levels divert the resources previously used to finance the local private sector, towards debt payments and charges being transferred abroad. Stated differently, high debt
levels divert the resources previously used to finance local companies toward service payments and charges being transferred abroad. Therefore a negative relationship is expected; the higher the debt the lower the private investment and vice versa.

viii CPS= Credit to the private sector

Another important factor that affects the private sector investment is credit availability. Due to underdeveloped capital markets and financial intermediation in developing economies, thus the absence of long-term financing and the futures market, bank loans and external borrowing may be the only sources of credit available for private sector investment financing. A positive relationship is expected, the higher the credit made available to the private sector the higher the level of investment.

ix Output growth= real GDP =RGDP

The real gross domestic product (RGDP) is used as a proxy for output growth. Real GDP is expected to induce the private investor to invest more, hence expected to have a positive impact on private investment. The neoclassical theory of investment, based on the work of Jorgenson (1963), treats the value of the capital stock desired by a competitive enterprise as a positive function of its output level. Accelerator theory also suggests that as demand or income increases in an economy, so does the investment made by firms. Furthermore, when demand levels result in an excess in demand, firms increase investment to match demand. Thus, a positive relationship is expected between output (proxied by real GDP) and private investment.
4.4 Data Type and Source

The research covered the period of 1970-2008 and made use of secondary data that were sourced from the Bank of Ghana, International Financial Statistics CD-Rom of the IMF, World debt tables of the World Bank and the Ghana Stock Exchange. Data on interest (lending rate), inflation (CPI, base year 1997) and exchange rates were obtained from the Bank of Ghana and IMF: International Financial Statistics CD-Rom each covering the above stated period. Data on external debt was obtained from the World Bank, World debt tables for the period of 1970-2008. Data on real GDP (base year 1993) was obtained from the Bank of Ghana, for the period 1970-2008. Data on credit to the private sector was obtained from the Bank of Ghana, for the period 1990-2008 and another data on the same variable was obtained from IMF: International Financial Statistic CD-Rom for the period under study. Data on government budget deficit also comes from International Financial Statistics CD Rom for the period 1970-1982 and then complemented with data from the Bank of Ghana for the period of 1983-2008.

Data on private investment and public investment (as % GDP) were obtained from Asante. (2000), for the period of 1970-1992, then supplemented with private investment (using private capital formation as proxy) and public investment (using government capital expenditure as proxy) data from IMF: International Financial Statistic CD-Rom for the period of 1993-2008. Finally, the stock market variable comes from Ghana Stock Exchange (market statistics, February 2010) for the 1990-2008. Domestic savings was obtained from IMF: International Financial Statistics CD-Rom was used as proxy for the period of 1970-1989, when the Ghana Stock Exchange was not in existence. Surprisingly no workable data was obtained from the Ghana Statistical Service and Ghana Investment Promotion Centre.
4.5 Model Specification

The model specification of this study follows that of Ribeiro and Joanilio (2003) with little modification in terms of the cost factors and the non cost factors. The modified model is given as in equation (1):

\[ PINV = \beta_0 + \beta_1 SM + \beta_2 GI + \beta_3 RGDP + \beta_4 CPS + \beta_5 INTR + \beta_6 BD + \beta_7 EXR + \beta_8 NFL + \beta_9 EXD + \varepsilon \quad (1) \]

Where PINV is private investment, SM is the stock market, GI is government or public sector investment, RGDP is the real gross domestic product, CPS is the credit to the private sector, INTR is the real interest rate, BD is the government budget deficit, EXR is the real exchange rate, NFL is the inflation rate and EXD is the external debt.

Where \( \beta_1 > 0, \beta_2 < 0 \) or \( \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 < 0, \beta_6 < 0, \beta_7 < 0, \beta_8 < 0, \beta_9 < 0 \), are the coefficients of the explanatory variables in the model whilst \( \varepsilon \) is the error term and \( \beta_0 \) is the constant term. The private investment function derived is a variant of the flexible accelerator principle designed to account for the objective of the study. The study employs the Johansen–Juselius (1990) multivariate cointegration technique for estimation of the long run private investment function.

4.6 Econometric Techniques for Estimation

4.6.1 Test of Unit Root.

Current standard regression analysis begins with the investigations into the stationarity of the variables that are used. The Augmented Dickey–Fuller (ADF) test is employed to determine the level or degree of integration of the variables – how many times the variables need to be differenced to attain stationarity.
Thus ADF test equation:

\[ \Delta Y_t = \mu + \gamma T + \delta Y_{t-1} + \sum_{i=1}^{k} \lambda_i \Delta Y_{t-i} + \xi_t \]

Where \( Y_t \) represents the variable in question, \( T \) is the trend, \( k \) is the lag length and \( \xi_t \) is a random variable assumed to be a "white noise".

Hypothesis to be tested is as follows:

\[ H_0 : Y_t \text{ is having a unit root/ or nonstationary/ not integrated of order zero} \]

\[ H_1 : Y_t \text{ is having no unit root/or stationary/integrated of order zero} \]

**4.6.2 ADF Unit Root Test Procedure**

The time series properties of the data were examined so as to ensure consistency. Hence a unit root test using the ADF test was conducted to establish the order of integration for the variables. All the variables were not stationary in their levels at both 1% and 5% significant levels. This implies that running any model here could produce spurious relationships. To make the variables stationary, the first difference of the variables were taken. Table 1 presents the ADF test on each variable in levels and table 2 presents the variables in first difference.

Determining the order of integration, the critical values were less than the calculated values in absolute terms for all the series in all cases. The results showed that the first differences of all the variables were stationary at 1% significant level. Thus all the nine variables being considered under the study were integrated of order one. In other words, all the variables in the model are I(1). Table 2 showed the results of the ADF Unit Root test in their difference which is stationary at the conventional 5% level of significance. Also, a line graph of the
variables in levels and first differences are reported in appendices A and B respectively. This is in support of the stationarity of the variables. Generally, the graph of variables in first differences, show stochastic movement around the zero mean confirming that the variables are indeed stationary in first difference.

4.6.3 Test of Cointegration

Since the variables to be used are all not likely to be stationary, applying ordinary least squares (OLS) will produce spurious result as noted by Granger and Newbold (1974). Engle and Granger (1987) developed a two-step approach, which is based on an OLS estimation of the long-run equation and a unit root test of the residuals. If the residual series is stationary it is included in the (differenced) short-run specification as an error correction term, whose coefficient provides information on the speed of adjustment to equilibrium. Although popular, the single-equation approach has its shortcomings. If there are more than two variables in a model, there may be more than one cointegrating vector. With the single-equation approach these different cointegrating vectors cannot be identified. But even if there is only a single cointegrating vector, the univariate approach is inefficient if not all variables on the right-hand side of the cointegrating vector are weakly exogenous. The multivariate error correction approach, which has been developed by Johansen (1988, 1991) and Johansen and Juselius (1990), overcomes most of the problems of the two-step approach. The EC model for the money investment function takes the form:

\[ \Delta z_t = \sum_{i=1}^{k-1} \Gamma_i \Delta z_{t-i} + \Pi z_{t-1} + (\Psi D_t) + u_t \] .................................(3)

Where:

\[ Z = (RGDP, INTR, NFL, EXR, GI, SM, EXD, BD, CPS), \Gamma, \Pi, \Psi \] .................................(4)
The variable \( u_t \) represents random disturbance while \( k \) represents the number of lag length. \( D_t \) is a vector of exogenous variables and \( \Psi, \Pi, \Gamma \) are vectors of parameters. The matrix \( \Pi = \alpha \beta' \) contains information on the long-run relationship where \( \alpha \) represents the speed of adjustment to disequilibrium while \( \beta \) is a matrix of long-run coefficient. Using the methods provided by Johansen (1988), the rank of the matrix \( \Pi \) is tested to establish the presence of cointegration or not. If there is cointegration then an Error Correction Model exists. The linear restrictions on parameters \( \alpha \) and \( \beta \) are also tested using likelihood ratio tests.\(^1\)

Consequently, the Johansen procedure for cointegration was used to carry out the long run relationship analysis between the variables. The method was chosen over the Engle-Granger Cointegration Test because the latter is used for bivariate models and there was more than one cointegration equation in the regression. The Johansen test is carried out under two main assumptions. These are the no deterministic trend and the linear deterministic trend. In carrying out the cointegration test for this study, the no deterministic trend assumption was used because it is consistent with the ADF test.

### 4.6.4 The Johansen Cointegration Procedure

To test for cointegration the Johansen (1988) methodology is applied to the regression framework. Gonzalo (1994), argues that the Johansen approach has clearly better asymptotical properties to detect long-run equilibrium than a range of other estimators. Specifically, the Johansen procedure performs better than others even when the errors are not normally distributed or when the dynamics are unknown.

\(^1\) see Johansen 1988, 1991; Johansen and Juselius 1990
Given that the variables are I(1), the regression process \( R(p) \) with the form of Equation (5) can be represented by the ECM \((p-1)\) as in Equation (6):

\[
\begin{align*}
\Delta x_t &= A_0 + A_1 x_{t-1} + A_2 x_{t-2} + ... + A_p \Delta x_{t-p} + \mu_t \tag{5}\\
\Delta x_t &= A_0 + \Pi x_{t-1} + \Gamma_1 \Delta x_{t-1} + \Gamma_2 \Delta x_{t-2} + ... + \Gamma_{p-1} \Delta x_{t-(p-1)} + \mu_t \tag{6}
\end{align*}
\]

Where: \( \mu_t \sim (0, \Omega) \forall t \) and \( E(\mu_t, \mu_t) = 0 \forall s \neq 0 \). \( x_t \) is an \((n \times 1)\) vector of endogenous variables and \( A_0, A_1, A_2, ..., \Pi, \Gamma_1, \Gamma_2, ..., \Gamma_{p-1} \) are the parameter matrices. Whether or not the I(1) variables are cointegrated, and if so how many cointegrating vectors exist, depends on the rank of the matrix \( \Pi \). Before estimating the rank of the matrix \( \Pi \), we need to determine how many lags should be included in Equation (6). Johansen (1991) suggests that the lag length should be specified such that the regression residuals are empirically Gaussian. As a lag selection strategy, we add lags incrementally until the series correlation of the residuals in the estimated regression is eliminated.

To determine the rank of the matrix \( \Pi \) or the number of cointegrating vectors, Johansen (1988) proposes the trace test and the maximum eigenvalue test. The trace test takes the following form:

\[
TR(r) = -T \sum_{j=r+1}^{m} \ln(1 - \hat{\lambda}_j)
\]

Where: \( \hat{\lambda}_1, \hat{\lambda}_2, ..., \hat{\lambda}_m \) are the estimated eigenvalues arranged in descending order and \( T \) is the number of usable observations. The null hypothesis is that the number of distinct cointegrating vectors is less than or equal to \( r \) against a general alternative.
The maximum eigenvalue test takes the following form:

\[ M(r) = -T \ln(1 - \hat{\lambda}_{r+1}) \]

Where: \( \hat{\lambda}_1, \hat{\lambda}_2, \ldots, \hat{\lambda}_m \) are the estimated eigenvalues arranged in descending order and \( T \) represents the number of usable observations. The null hypothesis is that the number of cointegrating vectors is \( r \) against the alternative of \( 1+r \) cointegrating vectors. After determining the number of cointegrating vectors \( r(0 < r < n) \), the matrix \( \Pi \) can be decomposed into two matrices \( \alpha(n \times r) \) and \( \beta(n \times r) \) such that \( \Pi = \alpha\beta. \)

Therefore, equation (6) can be rewritten in the form:

\[ dx_t = A_0 + \alpha(\beta'x_{t-1}) + \Gamma_1 dx_{t-1} + \Gamma_2 dx_{t-2} + \ldots + \Gamma_{p-1} dx_{t-(p-1)} + \mu_t \]

Where: \( \beta \) is the matrix of cointegrating vectors and \( \alpha \) is the matrix of speed of adjustment parameters. The \( \beta \) matrix measures the long-run equilibrium relationship among the variables, and the \( \alpha \) matrix measures the responses to deviations from long-run equilibrium.

Equation (7) can be estimated using the maximum likelihood method. Once \( \alpha \) and \( \beta \) are determined, various restrictions on \( \alpha \) and \( \beta \) can be examined by a likelihood ratio (LR) test which compares the maximized value of the log-likelihood function of unrestricted and restricted models. The statistic for this test is given by \( 2[\ell_u - \ell_r] \), where \( \ell_u \) and \( \ell_r \) denote the maximized values of the log likelihood function of the unrestricted and restricted models, respectively.

4.7 Error Correction Model

The error correction model (ECM) was constructed in order to appreciate the short-run dynamics of the private investment function, having established that a long-run relationship
exists between the variables. The error correction model has both the short run and long run components. The long run component of the model is given by the error correction term. As already mentioned, the fact that the variables are co-integrated indicates that the ECM can be formulated to assess the linkages between the variables. The error correction term in the model allowed the variables to be assessed, so as to find out which variables move to balance the long run relation. In other words, the error correction model shows the short-run direct effects between variables but not the total effect resulting from both direct and indirect impacts. If the error correction term is insignificant the estimated co-integration relation is unlikely to be valid or strong.

4.8 Diagnostic Test

To ensure that the model conforms to standards and render the results reliable, the following tests are carried out to assess the performance of the model. These tests include pairwise correlation test (correlation matrix of dependent and independent variables), autocorrelation tests, Jarque-Bera Normality test, Heteroscedascity tests, and Ramsey reset test. In addition, stability tests are also undertaken to ascertain the stability or otherwise of the models using the Cumulative Sum (CUSUM), Cumulative Sum of Squares (CUSUM Square) and Recursive Residual tests.

The stability of the private investment functions is important for effectiveness of investment policy in Ghana. In stability tests, the estimated investment function is assessed to see if it has shifted or not over the study period. The Cumulative sum (CUSUM), Cumulative Sum of Squares (CUSUM of Squares) and Recursive residual tests are applied. The CUSUM test is based on the cumulative sum of the recursive residuals. The expectations of the CUSUM statistics are zero under the null hypothesis of constant parameters. The CUSUM and
CUSUM Square statistics are plotted within a 5% significance confidence bounds. For the hypothesis of parameter constancy to be accepted, the statistic must revolve around zero within the confidence bounds. The CUSUM and CUSUM Squares tests show that the hypothesis of parameter constancy is not rejected as their statistic falls within the 5% confidence bound. This is supported by the Recursive residual test which shows that the entire variables lie within the $\pm 2$ standard error bound. The recursive residuals are used to test for structural changes in the models over time.

4.9 Pair-wise Correlation Test

The pairwise correlation test (i.e. the correlation matrix of dependent and independent variables) establishes the association between the dependent variables and all the independent variables used in the study. The dependent variable in this case is private investment whilst the independent variables are the cost factors (interest rate, exchange rate, inflation rate and budget deficit) and the control variables: non cost factors (real GDP, public investment, credit to the private sector, stock market and external debt).

4.10 Conclusion

Using econometric testing the study will be able to determine which of the hypothesized model of investment actually do move in ways consistent with the hypotheses that they really impact on investment. The testing procedures will also be able to suggest something about the possible marginal effects on investment that may result from changes in the variables. Reliability and Stability of estimates can also be established.
The choice of time series analysis for the study is based on the fact that most time series data are non-stationary and therefore give "spurious regression" the study used Johansen co-integration and Error correction method technique. Basically, co-integration means non-stationary time series tend to move together such that a linear combination of them will be stationary. Estimation of long run equation of variables using ordinary least squares and the estimated residuals from this regression was used in the estimation of a short run equation (error correction model) which eliminated the bias in the regression.
CHAPTER FIVE

EMPIRICAL RESULTS AND ANALYSIS

5.0 Introduction

This chapter presents the empirical results and discusses the contextual interpretation or findings of the research. Thus the chapter discusses the unit root test, test of co-integration, the error correction model and the empirical findings.

5.1 ADF Unit Root Test Results

Under the ADF test, the null hypothesis is that the true values of the coefficients are zero (unit roots) which would be rejected if the computed t-ratios are larger than their critical values.

The table below reports the results of the ADF test statistics for unit roots (stationarity) which includes a constant and a trend.

Table 1: ADF Unit Root Test Results in Levels.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>t-ADF value</th>
<th>Order of Integration</th>
<th>Number of lags</th>
</tr>
</thead>
<tbody>
<tr>
<td>PINV</td>
<td>-0.4049</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>SM</td>
<td>-1.7192</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>GI</td>
<td>-1.8000</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>RGDP</td>
<td>-1.7896</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>CPS</td>
<td>-0.5623</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>EXD</td>
<td>-1.0374</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>INTR</td>
<td>-1.1745</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>BD</td>
<td>-0.6951</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>EXR</td>
<td>-1.5059</td>
<td>I(0)</td>
<td>1</td>
</tr>
<tr>
<td>NFL</td>
<td>-1.6817</td>
<td>I(0)</td>
<td>1</td>
</tr>
</tbody>
</table>

Critical Values (ADF) in levels are:

\[ 5\% = -1.95 \quad 1\% = -2.626 \]
The results below indicate the non-stationary series in the first difference are now stationary. All the series seem to \( I(1) \) (i.e. integrated at order one) in levels so the necessary condition for co-integration among variables is satisfied.

Table 2: ADF Unit Root Test Results in First Difference

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>t-ADF value</th>
<th>Order of Integration</th>
<th>Number of lags</th>
</tr>
</thead>
<tbody>
<tr>
<td>D(PINV)</td>
<td>-7.663**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(SM)</td>
<td>-10.58**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(GI)</td>
<td>-6.455**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(RGDP)</td>
<td>-2.8652**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(CPS)</td>
<td>-5.741**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(EXD)</td>
<td>-4.518**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(INTR)</td>
<td>-8.176**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(BD)</td>
<td>-5.786**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(EXR)</td>
<td>-2.7345**</td>
<td>I(1)</td>
<td>1</td>
</tr>
<tr>
<td>D(NFL)</td>
<td>-10.98**</td>
<td>I(1)</td>
<td>1</td>
</tr>
</tbody>
</table>

Critical Values (ADF) in first difference are:

5\% = -1.95  \hspace{1cm} 1\% = -2.626

NB: ** = 1\% level of significance  \hspace{1cm} * = 5\% level of significance
5.2 Diagnostic Test

Below is the summary of the diagnostic statistics:

<table>
<thead>
<tr>
<th>Test</th>
<th>F - Statistics</th>
<th>TR&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Significance Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normality Jarque – Bera</td>
<td>1.122033</td>
<td>0.570629</td>
<td></td>
</tr>
<tr>
<td>Breusch – Godfrey Serial Correlation LM Test</td>
<td>1.097045</td>
<td>0.351437</td>
<td></td>
</tr>
<tr>
<td>White Heteroscedasticity Test (no cross products)</td>
<td>3.083359</td>
<td>0.214021</td>
<td></td>
</tr>
<tr>
<td>Ramsey Reset Test</td>
<td>1.352623</td>
<td>0.275284</td>
<td></td>
</tr>
<tr>
<td>TR&lt;sup&gt;2&lt;/sup&gt;</td>
<td>20.04934</td>
<td>0.271713</td>
<td></td>
</tr>
<tr>
<td>ARCH (3)</td>
<td>1.168735</td>
<td>0.290867</td>
<td></td>
</tr>
<tr>
<td>F - Statistics</td>
<td>0.843030</td>
<td>0.480477</td>
<td></td>
</tr>
</tbody>
</table>

NB: Figures in square brackets are significance probabilities

The Diagnostic tests conducted indicate that the specification is correct based on the Ramsey Reset test. In addition, the tests showed that there is no autocorrelation, no heteroscedasticity and the errors are normally distributed. Thus, the index of each of the independent variables influences Ghana’s private investment function over the period under study. The low probability associated with the F-test for the overall regression also lends credence to the short run model.

The CUSUM, CUSUM of Squares and Recursive residual tests of stability confirm that the estimated model is stable as shown in Figures 1, 2 and 3 below:
FIGURE 1. CUSUM Test for Stability

FIGURE 2. CUSUM SQUARES Test for Stability

FIGURE 3. Recursive Residual test for stability
Table 3: Correlation Matrix of Dependent (PINV) and Independent Variables Results:

<table>
<thead>
<tr>
<th></th>
<th>PINV</th>
<th>SM</th>
<th>GI</th>
<th>RGDP</th>
<th>EXD</th>
<th>CPS</th>
<th>INTR</th>
<th>BD</th>
<th>EXR</th>
<th>NFL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PINV</td>
<td>1</td>
<td>0.4029</td>
<td>0.4622</td>
<td>0.6503</td>
<td>-0.4495</td>
<td>0.6705</td>
<td>-0.5193</td>
<td>-0.6751</td>
<td>-0.6122</td>
<td>-0.5986</td>
</tr>
<tr>
<td>SM</td>
<td>0.4029</td>
<td>1</td>
<td>0.4771</td>
<td>0.5493</td>
<td>0.4636</td>
<td>0.5198</td>
<td>0.3661</td>
<td>-0.4947</td>
<td>-0.6523</td>
<td>-0.2046</td>
</tr>
<tr>
<td>GI</td>
<td>0.4622</td>
<td>0.4771</td>
<td>1</td>
<td>0.5051</td>
<td>0.9969</td>
<td>0.5067</td>
<td>0.4211</td>
<td>0.4176</td>
<td>0.6327</td>
<td>-0.2132</td>
</tr>
<tr>
<td>RGDP</td>
<td>0.6503</td>
<td>0.5493</td>
<td>0.5051</td>
<td>1</td>
<td>0.4889</td>
<td>0.8611</td>
<td>0.6417</td>
<td>-0.7927</td>
<td>0.9502</td>
<td>-0.3756</td>
</tr>
<tr>
<td>EXD</td>
<td>-0.4495</td>
<td>0.4636</td>
<td>0.9969</td>
<td>0.4889</td>
<td>1</td>
<td>0.4926</td>
<td>0.3734</td>
<td>-0.4008</td>
<td>-0.6185</td>
<td>-0.2063</td>
</tr>
<tr>
<td>CPS</td>
<td>0.6705</td>
<td>0.5198</td>
<td>0.5067</td>
<td>0.8611</td>
<td>0.4926</td>
<td>1</td>
<td>0.3952</td>
<td>0.5943</td>
<td>0.8621</td>
<td>-0.4863</td>
</tr>
<tr>
<td>INTR</td>
<td>-0.5193</td>
<td>0.3661</td>
<td>0.4211</td>
<td>0.6417</td>
<td>0.3734</td>
<td>0.3952</td>
<td>1</td>
<td>-0.7514</td>
<td>0.5357</td>
<td>-0.2064</td>
</tr>
<tr>
<td>BD</td>
<td>-0.6751</td>
<td>-0.4947</td>
<td>0.4176</td>
<td>-0.7927</td>
<td>-0.4008</td>
<td>0.5943</td>
<td>-0.7514</td>
<td>1</td>
<td>-0.6978</td>
<td>0.4771</td>
</tr>
<tr>
<td>EXR</td>
<td>-0.6122</td>
<td>-0.6523</td>
<td>0.6327</td>
<td>0.9502</td>
<td>-0.6185</td>
<td>0.8621</td>
<td>0.5357</td>
<td>-0.6978</td>
<td>1</td>
<td>-0.3186</td>
</tr>
<tr>
<td>NFL</td>
<td>-0.5986</td>
<td>-0.2046</td>
<td>-0.2132</td>
<td>-0.3756</td>
<td>-0.2063</td>
<td>-0.4863</td>
<td>-0.2064</td>
<td>0.4771</td>
<td>1</td>
<td>-0.3186</td>
</tr>
</tbody>
</table>

Source: computed from data collected; significance at 5%
A look at the correlation matrix (table 3) shows that for Ghana, the relationships between private investment and all the cost variables are strong, with the BD having the strongest negative correlation with PINV, (BD = -0.6751). The cost variables correlations are negative meaning that as the value of for instance BD falls; the value of PINV tends to go up. On the other hand the non cost variables, except external debt has positive relationships with PINV with the CPS having the strongest positive correlation, meaning that as the value of for instance CPS rises, the value of PINV tends to go up. In general, the positive coefficients exhibit a direct relationship with the PINV variable whilst those with the negative coefficients exhibit an inverse relationship with PINV. So this means these variables are associated with PINV, so it can be predicted that the variables would be statistically significant predictor variables in the regression model.

5.3 Johansen Cointegration Analysis

The result of the Johansen eigenvalue trace test is reported in the table below. The model was estimated using a one lag including a restricted term. At this lag the residual vectors from the system satisfies the no-autocorrelation assumption which is a critical assumption in the Johansen procedure. The trace eigenvalue test statistics suggests that the co-integration rank of the system is equal to one. This provides evidence that private investment and the other variables are tied together by one long run relationship or equivalently that they share a common stochastic trend.
Table 4 shows the results of the co-integration analysis performed:

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Max-Eigen statistic</th>
<th>1% critical value</th>
<th>Hypothesized No. of CE(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.979815</td>
<td>145.23571</td>
<td>87.39755</td>
<td>None *</td>
</tr>
<tr>
<td>0.825324</td>
<td>83.74878</td>
<td>76.38569</td>
<td>At most 1 *</td>
</tr>
<tr>
<td>0.783216</td>
<td>62.84647</td>
<td>65.29746</td>
<td>At most 2</td>
</tr>
<tr>
<td>0.657139</td>
<td>41.77783</td>
<td>45.29846</td>
<td>At most 3</td>
</tr>
<tr>
<td>0.557677</td>
<td>32.07664</td>
<td>37.73728</td>
<td>At most 4</td>
</tr>
<tr>
<td>0.482138</td>
<td>24.41278</td>
<td>30.28746</td>
<td>At most 5</td>
</tr>
<tr>
<td>0.357126</td>
<td>15.24173</td>
<td>25.22947</td>
<td>At most 6</td>
</tr>
<tr>
<td>0.297315</td>
<td>10.42975</td>
<td>18.10935</td>
<td>At most 7</td>
</tr>
<tr>
<td>0.126839</td>
<td>6.38974</td>
<td>11.63829</td>
<td>At most 8</td>
</tr>
<tr>
<td>0.047834</td>
<td>2.90457</td>
<td>6.35781</td>
<td>At most 9</td>
</tr>
</tbody>
</table>

Table 5: Normalized Co-integration Coefficients

<table>
<thead>
<tr>
<th>PINV</th>
<th>SM</th>
<th>GI</th>
<th>RGDP</th>
<th>CPS</th>
<th>EXD</th>
<th>INTR</th>
<th>BD</th>
<th>EXR</th>
<th>NFL</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>0.000</td>
<td>0.0114</td>
<td>-0.0074</td>
<td>-0.0283</td>
<td>0.0063</td>
<td>0.0219</td>
<td>0.0125</td>
<td>0.0194</td>
<td>0.0328</td>
<td>-7.4185</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0142)</td>
<td>(0.0029)</td>
<td>(0.0131)</td>
<td>(0.0049)</td>
<td>(0.0095)</td>
<td>(0.0027)</td>
<td>(0.0052)</td>
<td>(0.0049)</td>
<td>(2.6772)</td>
</tr>
<tr>
<td>0.000</td>
<td>1.000</td>
<td>0.0472</td>
<td>-0.1037</td>
<td>-0.0215</td>
<td>-0.0578</td>
<td>-0.0452</td>
<td>0.0613</td>
<td>-0.0839</td>
<td>0.0503</td>
<td>1.2981</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0176)</td>
<td>(0.0812)</td>
<td>(0.0092)</td>
<td>(0.0140)</td>
<td>(0.3904)</td>
<td>(0.0257)</td>
<td>(0.0216)</td>
<td>(0.0371)</td>
<td>(1.0219)</td>
</tr>
</tbody>
</table>

Log likelihood ratio = - 69.374

NB: Standard Errors are in parenthesis.
Table 6: Johansen Long Run Results

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>Standard Error</th>
<th>t-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>D(DPINV(-1))</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(DSM(-1))</td>
<td>0.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(DGI(-1))</td>
<td>0.0114</td>
<td>0.0142</td>
<td>0.8028</td>
</tr>
<tr>
<td>D(DRGDP(-1))</td>
<td>0.0074</td>
<td>0.0029</td>
<td>2.5517</td>
</tr>
<tr>
<td>D(DCPS(-1))</td>
<td>0.0283</td>
<td>0.0131</td>
<td>2.1603</td>
</tr>
<tr>
<td>D(EXD(-1))</td>
<td>0.0063</td>
<td>0.0049</td>
<td>1.2857</td>
</tr>
<tr>
<td>D(INTR(-1))</td>
<td>0.0219</td>
<td>0.0095</td>
<td>2.3053</td>
</tr>
<tr>
<td>D(DBD(-1))</td>
<td>0.0125</td>
<td>0.0027</td>
<td>4.6296</td>
</tr>
<tr>
<td>D(DEXR(-1))</td>
<td>0.0194</td>
<td>0.0052</td>
<td>3.7308</td>
</tr>
<tr>
<td>D(DINFL(-1))</td>
<td>0.0328</td>
<td>0.0049</td>
<td>6.6939</td>
</tr>
<tr>
<td>C</td>
<td>7.4185</td>
<td>2.6772</td>
<td>2.7710</td>
</tr>
</tbody>
</table>

Log likelihood ratio: 69.374

NB: The results does not produce probabilities, all the same, the long run results is significant when the absolute t-value is above two (2).

It can be observed from table 4 (Max-Eigen statistic > 1% critical value) and table 5. that there are two (2) co-integrating vectors that span the variables in the system as expressed in the normalized equations (1) and (2) below.

5.4 Normalized Equations

The normalized equations from the co-integration analysis are:

PINV = 7.4185 + 0.0114GI + 0.0074RGDP + 0.0283CPS - 0.0063EXD - 0.0219INTR
0.0125BD - 0.0194EXR - 0.0328NFL .........................................................(1)

SM = -1.2981 - 0.0472GI + 0.1037RGDP + 0.0215CPS + 0.0578EXD + 0.0452INTR -
0.0614BD + 0.0839EXR - 0.0503NFL .........................................................(2)
Equation one (1) is chosen over the second equation because the dependent variable is the variable of interest and secondly it is compatible with theory. However the results of the regression analysis of the second equation are reported in appendix C.

Therefore the estimated long run equilibrium had the following form:

\[
PINV = 7.4185 + 0.0114GI + 0.0074RGDP + 0.0283CPS - 0.0063EXD - 0.0219INTR - 0.0125BD - 0.0194EXR - 0.0328NFL
\]

(1)

The results indicate the existence of a long-run effect of the independent variables in the normalized equation. Thus, there is a long-run relationship between \textit{private investment} and all the independent variables in the model except the stock market variable.

5.5 Analysis of the Long Run Econometric Results

The econometric result shows that all the cost variables had negative and statistically significant impact on private investment in the long run, with the inflation variable having the strongest and highly significant impact.

The interest rate variable had a negative and significant impact on private investment in Ghana. A 1% increase in interest rate lead to about 2.2% decrease in private investment in the long run. This confirms as in Neo-Classical theory that interest rate is a very important factor in any investment decision by the private sector. When the interest rate is increased by raising the cost of bank credit (lending interest rate) or by increasing the cost of retained earnings, which is the main source of financing for the private sector, there would be a decline in private investment. On the other hand, Mckinnon and Shaw, view administered low interest
rates as detrimental to increased savings and hence investment boost. They argued that high interest rate induces savings which can be channeled into investment, this result therefore does not confirm the McKinnon and Shaw theory. Further, the findings from this study confirmed the negative relationship between interest rate and private sector investment which is consistent with other empirical works like Greene and Villanueva (1991); Khan and Khan (2007) and at variance with other studies likes Seruvatu and Jayaraman (2001); Jongwanich and Kohpaiboon (2008). Interest rates can have a substantial influence on the rate and pattern of economic growth by influencing the volume and productivity disposition of savings as well as the volume and productivity of investment. Consequently, the evidence from the regression results shows that high interest rate is indeed detrimental to private investment in Ghana.

It can also be seen from the result that government budget deficit is significantly and negatively related to private investment in the long run. As a 1% increase in budget deficit would lead to 1.25% decrease in private investment. This finding is in line with the one obtained by Heim (2008). It is important to note that the spillover of large budget deficit can compel private investors to shift some of their portfolio into short-term activities such as purchases of treasury bills, due to high yield and safety. Thus, the monetization of the budget deficit is crowding out private investment by attracting investible funds from business activities into treasury bills. Also, the large budget deficit with no check and balance on government expenditure is an example of institutional weakness.

The exchange rate also affected private investment negatively in Ghana. According to this result a 1% increase in exchange rate would cause private investment to decrease by 1.94%. The results revealed that the exchange rate was negatively related to private investment and was significant just like the works of Froot and Stein (1991) as well as Asante (2000) which
also found a negative relationship between exchange rate and private investment. However, the result is contrary to the empirical work of Jongwanich and Kohpaiboon (2008). This negative effect can be explained by the fact that a real depreciation raises the cost of imported capital goods and since a large chunk of investment goods in Ghana is imported, domestic private investment would be expected to fall with a real depreciation. Again, this may be due to the fact that in the past the exchange rate was fixed but currently it is floating and depreciating at an alarming rate and therefore causing a lot of concern for investors.

The findings of the empirical analysis also indicate that the effect of inflation is the strongest, it is negatively related to private investment and was significant. The result shows that a 1% increase in inflation would lead to a drastic fall in private investment by 3.28%. The result of this study is consistent with many empirical findings like, Jongwanich and Kohpaiboon (2008); Greene and Villanueva (1991); Pindyck and Solimano (1993) and at variance with Ndikumana, (2000). Inflation rates are noted to be an indicator of macroeconomic instability, which can have adverse impact on private investment. High and unpredictable inflation distorts the information content of relative prices and increases the riskiness of longer-time investment. A high rate of inflation tends to discourage private savings and investment.

Similarly the control variables also impacted on private investment as explained below: Government or Public investment variable had a positive and insignificant relationship with the rate of private investment. The result may be interpreted as 1% increase in public investment would lead to 1.14% increase in private investment all things being equal. This positive relationship suggests complementarity between the public investment and private investment. These results suggest that the productivity of these types of investments may be as important as their magnitude in influencing private investment. The positive relationship
between private-sector investment activity and government investment in Ghana, suggests that a long-run investment rate has a positive impact. The meaning of this is that a lot of infrastructural investment has been undertaken by the government which has a positive impact on private investment. Again this result is similar to the findings of Asante (2000). The crowding out effect of public investment on private investment was not the case for Ghana in this study.

The regression result shows that Real GDP has a positive and significant impact on private investment in the long run. This result is similar to findings from Greene and Villanueva (1991), Asante (2000), Badawi (2005) among others. They also found private investment to be positively related to real output. The result shows that a 1% increase in real GDP will lead to about 0.74% increase in private investment. The accelerator model suggests a positive relationship between changes in aggregate demand and real output growth, which investors attempt to satisfy. Increased output may also mean increased savings that can be used to finance domestic investment (Elhiraika, 2001).

The result also indicates that bank credit to private sector have a positive and significant impact on private investment activities in Ghana. Bank credit remains the most important source of investment financing among private enterprises in developing countries including Ghana. The direct impact of credit availability on private investment is confirmed in several empirical studies including that of Asante (2000) and Badawi (2005). The growth of real credit to the private sector had a positive and statistically significant impact on private investment. The results revealed that 1% increase in credit to the private sector would improve private investment in Ghana by about 2.83%. It is therefore very important to encourage financial institutions to increase their credit facilities to the private sector especially the productive sector of the private sector.
The results also show that high external debt has a negative impact on the private investment in Ghana but not significant. The empirical figures indicate that a 1% increase in external debt may cause private investment to fall by 0.63%. Several studies have emphasized that a heavy debt overhang reduces the incentive to invest because of the anticipated foreign tax on future income and returns on investment. A high external debt signifies that part of the future returns on any investment must be used to service the existing stock of debt. The presence of large external debt burdens constitutes another source of uncertainty in the macroeconomic environment. Thus, the level of the real exchange rate and the timing of demand management policies consistent with the required transfer also become uncertain. A higher external debt level could be an indicator of over-indebtedness, signaling the lack of viability and sustainability of current macroeconomic policies in the long term, and most likely negatively impacting investors' expectations due to the increase in the degree of uncertainty on future policies. The results confirm the findings of Greene & Villanueva, (1991).

5.6 The Error Correction Model:

The Error Correction Model was constructed in order to appreciate the short-run dynamics of the private investment function, having established that a long-run relationship exists between the variables employed. The error correction model has both the short run and long run components. The long run component of the model is given by the error correction term. The coefficient of the error correction term shows the amount of disequilibrium transmitted each period into the equation. From the equations we observe that the error correction term from the cointegration equation is correctly signed and significant. It has value of about 34% percent indicating a low speed of adjustment to the long run equilibrium. A negative and significant coefficient on the ECM implies a positive response of private investment to
fluctuations that depress the value of the stationary combination. Conversely, if the ECM
were insignificant, it would mean that there is an absence of any long-run adjustment of the
investment measures to movements amongst the explanatory variables.

The estimated Error Correction results are presented in table 7, below:

Table 7: Results of the Error Correction Model (Private Investment Model)

Dependent Variable: DPINV
Method: Least Squares
Sample (adjusted): 1972 2007
Included observations: 35 after adjustments

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-2.328105</td>
<td>0.319211</td>
<td>-7.293311</td>
<td>0.3022</td>
</tr>
<tr>
<td>DINV</td>
<td>-0.012252</td>
<td>0.005113</td>
<td>-2.396245</td>
<td>0.0024</td>
</tr>
<tr>
<td>DINV(-1)</td>
<td>-0.001342</td>
<td>0.000412</td>
<td>-3.257282</td>
<td>0.0032</td>
</tr>
<tr>
<td>DSM</td>
<td>-0.014622</td>
<td>0.005329</td>
<td>-2.743854</td>
<td>0.0143</td>
</tr>
<tr>
<td>DSM(-1)</td>
<td>-0.042714</td>
<td>0.023162</td>
<td>-1.844141</td>
<td>0.0427</td>
</tr>
<tr>
<td>DGI</td>
<td>-0.002842</td>
<td>0.001290</td>
<td>-2.203107</td>
<td>0.0014</td>
</tr>
<tr>
<td>DGI(-1)</td>
<td>-0.011432</td>
<td>0.002724</td>
<td>-4.196769</td>
<td>0.0227</td>
</tr>
<tr>
<td>DRGDP</td>
<td>0.003354</td>
<td>0.002176</td>
<td>1.541360</td>
<td>0.0543</td>
</tr>
<tr>
<td>DRGDP(-1)</td>
<td>0.000914</td>
<td>0.000425</td>
<td>2.150588</td>
<td>0.0056</td>
</tr>
<tr>
<td>DCPS</td>
<td>0.010042</td>
<td>0.009462</td>
<td>1.061298</td>
<td>0.0761</td>
</tr>
<tr>
<td>DCPS(-1)</td>
<td>0.001232</td>
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<td>3.412742</td>
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R-squared          0.712412 | Mean dependent var 0.450854
Adjusted R-squared  0.721129 | S.D. dependent var 0.054218
S.E. of regression  0.114589 | Akaike info criterion 3.731611
Sum squared residual 0.144436 | Schwarz criterion 3.941251
Log likelihood      -74.73465 | F-statistic 0.035138
Durbin-Watson stat  2.025314 | Prob (F-statistic) 0.000211
The Akaike Information Criterion (AIC) indicates that a lag length of one (1) was optimum. This is consistent with the small sample size of the data. From the error correction analysis, the error correction terms is correctly signed and significant with the absolute t-values above two (2).

5.7 Analysis of the short run dynamics

There was a strong negative and highly significant impact of interest rate on private investment in the short run. A 1% increase in the interest rate discouraged private investment by 5.02% in the short run. This is consistent with the findings in previous studies, (Greene and Villanueva, 1991; Serven and Solimano, 1991) and inconsistent to the results of Jongwanich and Kohpaiboon, (2008); Khan and Khan (2007). The strong impact of the interest rate variable supports the fact that interest rate is a major hindrance to private investment in the short run.

The exchange rate (EXR) was positive and statistically significant, a 1% depreciation of EXR (i.e., an increase in EXR) leads to an increase in private investment in the short run by 1.25%. The positive and significant coefficient corresponding to EXR, may not reflect the nature of an import-led economy in Ghana. Also, in the short-run, the inflation rate was negative and insignificant. However, an increase in the variable by 1% leads to an decrease in private investment by 3.13%. This result is consistent with the findings in Khan and Khan, (2007).

In the short run, the budget deficit had a negative and insignificant impact on private investment. Thus, a 1% increase in this variable leads to a 2.08 % reduction in private investment. This result is contrary to Heim (2008). However, the insignificance impact of budget deficit in the short run would be due to the impact of credit availability that is likely to
overshadow the short-run effect of the former, thereby preventing the role of the budget deficit spillover in determining private investment.

In the short-run among the cost factors, interest rate (5.02%) was the most important constraint on private investment, whereas in the long run it was the inflation rate (3.28%). Therefore, emphasis should be on promoting a conducive investment climate, especially concerning inflation and interest rate. Even though changes in price levels (resulting from inflation and interest rates increases) to a certain extent reflect market forces acting on them, leaning against the wind of these changes could generate positive spillover in terms of generating a conducive investment climate and promoting long-term private investment.

On the other hand, in the short run the stock market activities which is proxied by domestic savings had a negative and insignificant impact on private investment. In the short-run, the real GDP was positive and significant, thus an increase in output growth (real GDP) by 1% leads to an increase in private investment by 0.09%. The positive and significant impact of output growth on private investment is consistent with the findings in previous studies, Blejer and Khan, (1984).

In the short run, public investment (GI) had a negative and insignificant impact on private investment implying a crowd out of public investment. This means a 1% increase in the public investment variable leads to a 1.4% reduction of private investment. This is consistent with the findings in previous empirical work, Ghani and Din, (2006). This means that most of the public investment undertaken in the short run has been for replacement purposes, rather than for expanding production capacity, raising a concern for the country’s long-term growth sustainability. In the short run the credit to the private sector variable (CPS) was positive and
significant just like the long run. A 1% increase in CPS variable resulted in a 0.12% increase private investment. This is consistent with the findings in previous empirical work of Jongwanich and Kohpaiboon, (2008). Implying more credit made available would ensure that potential and prudential investors can access credit adequately and help speed up the sluggish investment in the country. This is of importance especially for small and medium enterprises, which rely heavily on bank financing. The external debt (EXD) was positive but not significant in the short run. However, this means that a 1% increase in the EXD variable would lead to 0.17% increase in private investment, which is somehow contrary to the expected. This suggests that the debt overhang has become more important.

5.8 Conclusion

The findings from this study confirmed the first hypothesis that all the financing cost variables, thus interest rate, inflation rate, exchange rate and government budget deficit in the model have negative and significant impact on long run private investment in Ghana. Hence the results failed to reject the first null hypothesis. Concerning the second hypothesis, the study revealed that not all the determinants of private investment in the model were significant in the long run since variables such as public investment and external debt had the expected signs but were not significant as explained earlier. So it can be concluded that the second hypothesis is rejected and the second null hypothesis accepted. Last but not the least the assertion that there exists cointegration among the variables used and investment in Ghana which is the third hypothesis is also rejected on the grounds that the private investment variable, which is the dependent variable cointegrated with all the variables used in the study except the stock market variable proxied by domestic savings.
6.0 Introduction

This research has investigated empirically Financing Cost and Private Investment in Ghana over the period of 1970-2008. To this end, theoretical explanations and relevant literature pertaining to financing cost and private investment has been reviewed. It employed the Augmented Dickey–Fuller (ADF) test to address the issue of unit root faced in time series analysis. The long run estimate of the private investment function for Ghana was estimated using the Johansen co-integration technique. The Error Correction Model was used to determine the short-run dynamics of the variables used in the model. This study provides direct evidence that high cost of financing is associated with low investment. Financing cost thus remains a significant negative determinant of investment after controlling for the non cost factors of private investment.

6.1 Summary of Findings

The research found evidence that private investment, interest rate, exchange rate, inflation rate, budget deficit, public investment, real GDP growth, credit to the private sector and external debt are bound together in the long run. The evidence suggested that private investment is negatively affected by interest rate, exchange rate, inflation rate, budget deficit and external debt whilst public investment, real GDP and credit to the private sector affected private investment positively. The econometric results showed that the stock market was not found to have a statistically significant impact on private investment in Ghana during the period of the study.
The study showed that the components of cost (interest rate, inflation rate, exchange rate and budget deficit) are a major hindrance to private investment in Ghana. Of these cost variables, inflation rate and interest rate appeared to have had the strongest negative impact on private investment, whilst exchange rate and budget deficit had mild negative effects. For policies to improve private sector response, all four components must be addressed simultaneously. Policies to stabilize macroeconomic variables such as interest, exchange and inflation rates and as well cut down on government domestic borrowing for consumption purposes. These measures would bring deficit spending under control to relieve pressure on interest and inflation rates.

High interest rates reduce the present value of future cash flows thereby reducing the attractiveness of investment opportunities. For this reason interest (lending) rate is a key determinant of private expenditure, so the level of interest rate must be the most important macroeconomic factor to consider in the short run private investment analysis. At a higher interest rate therefore, the net profit of most projects will be lower or even negative thereby discouraging potential investors from investing. Symmetrically, at a lower interest rate level, more projects will become profitable, encouraging investors to invest more. Therefore higher cost of credit retards private investment, this implies that cost of borrowing is very important in making investment decisions.

The econometric results showed that inflation had the strongest negative and significant impact in the long run. Inflation affects investment by increasing the uncertainty of investment. A rise in domestic inflation relative to overseas inflation, given the nominal exchange rate, results in the appreciation of the real exchange rate adversely affecting export competitiveness. High rates of inflation adversely affect private investment by increasing the
riskiness of longer-term investment projects, reducing the average maturity of commercial lending and distorting the information content of relative prices. Also, high inflation rates are often considered an indicator of macroeconomic instability and a country's inability to control macroeconomic policy, both of which contribute to an adverse investment climate. Inflation also discourages long-term lending by financial intermediaries, which further reduces the investment rate.

According to Aryeetey (1994), massive frequent depreciation of the exchange rate has a direct implication for the cedi outlay required to import a given quantity of imported inputs such as raw materials, equipments or machinery. In this case, relying too much on imported raw materials implies that producers demand for working capital has to increase which might lead to a reduction in output. Meanwhile Asante and Addo (1997), indicated that production in the manufacturing sector was constrained by the limited availability of imported inputs in Ghana. This indicates that most of the firms in Ghana rely on imported inputs for their investment projects.

The extent to which government deficits create a "crowd out" problem (i.e., government borrowing which diverts savings that would otherwise be borrowed by private businesses to purchase new plant and equipment, into government hands), reduces the level of private investment. Crowd out theorists argue this competition between business and government for savings, forces interest rates up and substantially reduces the amounts business find profitable to borrow to invest. (Spencer and Yohe, 1970; Heim, 2007, 2008). This may also occur when the investment involves parastatal enterprises producing goods that compete with the private sector, or when heavy spending for public capital projects leads to high interest rates, severe credit rationing, or a heavier current or future tax burden (Aschauer, 1989).
On the other hand credit to the private sector had a strong statistically significant and positive impact on private investment whilst real output (GDP) growth and public investment had a mild positive impact on private investment. These results suggest that credit availability is pivot to the private sector participation in investment whilst government investment resulting from infrastructural development has been complementary to private investment in the country. Policies should be put in place to encourage lending to private investment activities as well as increase public spending for infrastructure development in order to increase production capacity and incomes levels to augment real output.

Credit however has been a problem and remains a problem for private investment. Credit must therefore be made available in order to ensure continuing participation of the private sector in investment. There should therefore be a change of government investment strategy by promoting financial development. Financial development facilitates the channeling of resources from savers to the highest-return investment activities, increases the quantity of funds available for investment, and thus mitigates the liquidity constraints faced by entrepreneurs. Thus a large and liquid financial system reduces the overall cost and risks of investment, which stimulates capital accumulation. The financial system is key to matching financial resources to investors needs both through short-term credit expansion and through its maturity transformation function, by channeling saving into long-term credit markets.

Financial markets play an important role in allocating investment capital to high return activities (Greenwood and Smith, 1997). Financial intermediaries have a special function of alleviating information problems, reducing liquidity risk, reducing monitoring costs, and channeling credit to certain classes of borrowers that cannot access non-intermediated forms
of credit (Levine, 1997; Pagano, 1993; Gertler, 1988). This analysis implies that low investment in developing countries including Ghana may be due to low financial intermediation characterised by a limited range of financial instruments, limited long-term lending, inefficient lending practices (for example, politically motivated lending), direct credit control, and crowding out of private investment by public borrowing for consumption purposes.

In similar vein the public investment had a significantly positive coefficient in relation to private investment in the long run. The results suggest a “crowding in” effect of the public investment on private investment. It seems the positive effect of infrastructural investment outweighs the negative effect of non-infrastructure investment. This result is consistent with the one obtained by Asante (2000). The government must undertake more infrastructural development to boost private investment in the country. Public investment on infrastructure is believed to have robust positive effect on private investment (Hadjimicheal and Ghura, 1995). These are believed to reduce private cost of production thus raising profitability, which in turn will stimulate private investment.

According to Mankiw (1994), GDP equals; the total income of everyone in the economy and the total expenditure on the economy’s output of goods and services. Thus GDP is a gauge of economic performance because it measures something people care about – their incomes. Similarly, an economy with a large output of goods and services can better satisfy the demands of households, firms and the government.

Ghana’s ability to achieve faster economic growth led by private sector investment depends, in large on developing efficient stock market that mobilizes funds from a wide range of the population and makes them available to private investors at a cheaper cost. Inefficient capital
market apart from denying local companies the opportunity to raise long term capital for investment, would also deny potential investors the opportunity to invest their excess funds in long term return projects. The emphasis on the growth of stock market for domestic resource mobilization has also been strengthened by the need to attract local and foreign capital in non-debt creating forms.

6.2 Conclusions

The private sector is the prime mover of an economy, however, private investors in Ghana, find it is difficult to raise affordable funds to finance their investment hence their investments are unable to grow as expected. (Asante, 2000). As a result, this study focused on financing cost of private investment in Ghana in order to ascertain what actually goes into the financing of private investment. Among other things, the study aims at finding the relationship and the direction of causality between financing cost factors and private investment in Ghana over the long run. To achieve the objectives of the study, three hypotheses were tested. The study also presented an overview of the investment climate in Ghana over the years with emphasis on the economic development strategies in the Ghanaian economy, domestic private investment in Ghana, foreign direct investment in Ghana, measures to stimulate the performance of private investment in Ghana, among others. It was shown that efforts over the years were quite impressive for the growth of private sector investment. Literature on investment in general, private investment and cost of financing among others were reviewed which informed the design of methodology and the data analysis. With regards to the literature reviewed, most of the studies found financing cost factors to be negatively related to private investment. Even though, most of these studies were carried out outside Ghana except that of Asante (2000) and Aryeetey (1994), all the studies seem to support the view that cost of financing is essential for private sector investment participation.
The empirical results and analysis presented in the previous chapter found evidence that interest rate, inflation rate, exchange rate and budget deficit statistically significant and negatively related to private investment over the long run. So the findings confirm the hypothesis that all the financing cost factors have a negative and significant impact on long run private investment in Ghana. Hence, the results failed to reject the first hypothesis. On the other hand, the control variables such as credit to the private sector, real GDP and government or public investment positively impacted on private investment, but the external debt had an adverse impact in the long run. The results also revealed that not all the variables of private investment in the specified model are significant in the long run since variables such as public investment and external debt were not significant. Hence, the results failed to accept the second hypothesis. Also, the notion that, there exists cointegration among the variables used and private investment in Ghana did not hold since the private investment variable cointegrated with all the variables used except the stock market variable. The study therefore provided direct evidence that high cost of financing is associated with low private sector participation in investment activities in Ghana.

6.3 Recommendations

It is clear from the study that cost of financing is detrimental to private investment in Ghana. This requires a look at conditions that create macroeconomic instability in the country. Thus there is the need to stabilize interest, exchange and inflation rates and as well reduce government budget deficit for current expenditure whilst efforts are made to increase revenue generation. The current Vision 2020, with its focus on private investment as the engine of economic growth, will only be successful if cost of financing is low and there is stable macroeconomic environment.
The main policies that may be inferred from these results are: firstly, as regards the effect of interest rate on private investment. In this circumstance therefore, the policy advice is that Government should explore the possibility of reducing the interest rate as this would stimulate investment, but without running the risk of keeping it very low as to discourage savings that provides loanable funds for investment. To do this effectively requires specifying a range within which fluctuation in the interest rate will not have an adverse effect on private investment. Obviously, this calls for interest rate regulatory body on all commercial banks by the Bank of Ghana, in the interest of promoting private investment.

Secondly, the negative effect of inflation on private investment in Ghana signifies the importance of a more focused macroeconomic policy environment that strengthens the economy and builds confidence for potential investors. Necessary steps have to be taken to contain inflation and stabilize exchange rate through the adoption of sound fiscal and monetary policies. The present flexible exchange rate policy and possibly the failure of policies to ensure stability are likely to be the cause of the variability in the exchange rate. To be able to check this variability, the Bank of Ghana must have the capacity to intervene in the exchange rate market from time to time to curb the rapid devaluation of the currency and also manage inflation.

Thirdly, the results suggested that increasing budget deficit of Ghana had a significant harmful effect on private investment, suggesting that the government must be discouraged from overspending its budget so as to refrain from financing its budget through the banking system. This will go a long way to reduce interest rates and promote private investment. There is therefore the need for the government to be forced to spend within it allocated budget
through law. To this end a fiscal compliance law is recommended to be enacted so as to help compel the government operate within its allocated resources.

Similarly, the results suggest that increasing public investment has a significant beneficial effect on private investment, suggesting that if private investment is to help reduce poverty, government should increase capital expenditure, provide training to entrepreneurs, private credit channeling agencies and develop institutions. Public investment must concentrate on rehabilitation and construction of physical infrastructure (transportation networks- road, rail, sea and air; hospitals, schools/training centres, electric power, water, sanitation, improving property rights, restructuring judicial system, maintain law and order etc.) which would complement private investment. Public investment increase returns to private capital, Blejer and Khan (1984). In this regard, for Ghana to have statistically significant public investment, government needs to explore other means for financing public investment that do not involve increasing domestic borrowing.

Moreover, in view of the positive impact of credit to the private sector on private investment, triggering off the financial resources or private capital accumulation is a useful channel to boost private sector development in Ghana. Credit however is unavailable or not easily accessible for productive investment in Ghana (Baah-Nuakuoh, 1996). Limited credit available to the private sector is directed towards the unproductive sectors. Further, the demand of the public sector for credit expended by the banking system further limits the funds available for productive investment by the private sector thereby choking off the private sector in the investment process. To overcome these problems, greater efforts must be directed towards enhancing the efficiency of credit allocation in the financial system while at the same time discouraging the government from increasing its borrowing from the financial
institutions. In line with this, the securities regulatory commission and the BOG must be given more powers and legal authority to monitor and regulate the financial system properly and effectively. By this measure, the banks would increase their efficiency. Again, the government can give tax incentives to financial institutions that finance risky investment such as those in Agriculture and manufacturing sectors.

The significantly positive real GDP growth signals a country’s economic prospects and encourages foreign investors. Keeping up the growth momentum and ascertaining its sustainability is a key to attracting private sector investment. In this regard, furthering the growth performance of the economy through the creation of favourable macroeconomic environment, developing vital infrastructure, ensuring the quality of institutions as well as improving the quality of human capital are some of the important measures essential to attract private investment.

Even though, the stock market variable could not cointegrate with private investment in the long run. The stock or capital market offers a relatively cheaper source of obtaining long term funds for investment projects. The following policies should be pursued to promote effective and well developed stock market: educational campaigns about the existence and activities of the GSE; Putting in place an attractive and flexible listing requirements, cheaper cost of trading on GSE and hedging mechanism through financial derivatives; futures, and options to reduce investor exposure; Many potential investors prefer to go for short term government treasury bills rather than equity. In this regard, it is advisable to make it attractive to potential investors and as well trade in more government bonds in order to keep the market active and liquid. The nominal increase in the all share index should always exceed the annual inflation.
rate so that the long-term returns on stock market investments will remain positive in real terms. Thus the profitability of the GSE listed companies should not be eroded.

Though political instability created a climate hostile to private investment, it was dropped in the process of running the econometric regression. However, there is the need to create an environment conducive for investment. Also some policies adopted in the 1970s and early 1980s scared away the private sector from participation in investment. It is therefore necessary for the government to give assurance to private investors that such situations will not arise again. The government must come out with a legislation that will secure private investment from any future seizures and forfeitures. Hence legislative and administrative laws should be enacted to enhance confidence among private investors. Confidence is a necessary condition for private investment and private investment is a necessary condition for economic growth and development.

The last but not the least, the much-awaited role of the private sector as an engine of growth has not yet materialized. If all these criteria are met, private investment will lead to economic growth. The government should therefore implement the above policy recommendations and create the enabling environment in order to raise the share of private investment to change the status-quo. Clearly, it is equally important for policymakers in developing countries including Ghana, to be able to assess how private investment responds to changes in financing cost not only in designing long-term development strategies, but also in implementing shorter-term stabilization programs. In the long run, the cost of credit reduction path seems to be closely dependent on both well-developed financial and credit markets; and on perspectives of macroeconomic stability.
6.4 Limitations of the Research

The major limitation encountered has to do with the availability and quality of the data used. There was no data available for private investment and public investment from GSS, GIPC, ISSER and BOG. As such data obtained from IMF-IFS CD-Rom on private capital formation and government capital expenditure were used as proxies for private investment and public investment respectively for the period of 1993-2008. Furthermore, the set of data used were basically secondary, its accuracy and or reliability had some questions, though attempt was made to address them. This therefore implies that the analysis made and conclusions drawn thereof should be interpreted with this in mind. Secondly, due to data limitations, particularly regarding frequency with which secondary data are produced, normally associated with less advanced nations like Ghana, a more appropriate methodology (ADF test) was employed in the regression analysis. Finally, accuracy of the recorded data exerted a significant influence on the conclusions that were drawn from the findings of the study. A minor limitation of the study is with respect to the time available for the research and fact that it focuses only on Ghana.

6.5 Future Research Area

A useful extension of the present study would be to empirically examine the effect of private investment on economic growth, unemployment and poverty reduction in the context of Ghana. Another area worth of researching into is the exchange rate which had a positive impact on private investment in the short run, which is contrary to theory. This therefore calls for a further investigation to determine the exact behaviour of exchange rate on private investment.
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World Bank (1993), “Ghana 2000 and Beyond Setting the Stage for Accelerated Growth and Poverty Alleviation”.


APPENDICIES

APPENDIX A

Graphs of level of the variables

PINV

SM

Gl

RGDP

CPS
APPENDIX B

Graphs of first difference of variables

DPINV

DSM

DGI

DRGDP

DCPS
## APPENDIX C

### Short-run error correction model (Stock Market Model)

Dependent Variable: DSM  
Method: Least Squares  
Sample (adjusted): 1972-2007  
Included observations: 35 after adjustments

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R-squared: 0.900323  
Adjusted R-squared: 0.710029  
S.E. of regression: 0.114589  
Sum squared resid: 0.144436  
Log likelihood: 42.79359  
Durbin-Watson stat: 2.224939
APPENDIX D

UNIT ROOT RESULTS
Ox version 3.00 (Windows) (C) J.A. Doornik, 1994-2001
PeGive 10.0b session started at 7:29:00 on 18-05-2010

Unit-root tests for 1972 (1) to 2008 (1)

Augmented Dickey-Fuller test for PINV; regression of DPINV on:

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</table>

\( \sigma = 1.43529 \)  \( DW = 2.407 \)  \( DW-PINV = 0.5131 \)  \( ADF-PINV = -0.4049 \)
Critical values used in ADF test: 5\%=-1.95, 1\%=-2.626
\( RSS = 74.16225942 \) for 1 variables and 37 observations

Augmented Dickey-Fuller test for SM; regression of DSM on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM_1</td>
<td>-0.50723</td>
<td>1.71925</td>
</tr>
</tbody>
</table>

\( \sigma = 2.59482 \)  \( DW = 2.343 \)  \( DW-SM = 1.226 \)  \( ADF-SM = -1.7192 \)
Critical values used in ADF test: 5\%=-1.95, 1\%=-2.626
\( RSS = 2.4238699346 \) for 1 variables and 37 observations

Augmented Dickey-Fuller test for GI; regression of DGI on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI_1</td>
<td>-0.25370</td>
<td>0.14094</td>
</tr>
</tbody>
</table>

\( \sigma = 4.7604812 \)  \( DW = 1.908 \)  \( DW-GI = 0.6196 \)  \( ADF-GI = -1.800 \)
Critical values used in ADF test: 5\%=-1.95, 1\%=-2.626
\( RSS = 8.1583918426 \) for 1 variables and 37 observations

Augmented Dickey-Fuller test for RGDP; regression of DRGDP on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDP_1</td>
<td>-0.150707</td>
<td>0.08422</td>
</tr>
</tbody>
</table>

\( \sigma = 1.9497308 \)  \( DW = 1.438 \)  \( DW-RGDP = 0.03037 \)  \( ADF-RGDP = -1.7896 \)
Critical values used in ADF test: 5\%=-1.95, 1\%=-2.626
\( RSS = 1.368516088 \) for 1 variables and 37 observations

Augmented Dickey-Fuller test for CPS; regression of DCPS on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPS_1</td>
<td>-0.016418</td>
<td>0.029198</td>
</tr>
</tbody>
</table>

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sigma = 1.48545  DW = 1.315  DW-CPS = 0.08847  ADF-CPS = -0.5623
Critical values used in ADF test: 5%=-1.95, 1%=-2.626
RSS = 79.43592065 for 1 variables and 37 observations

Augmented Dickey-Fuller test for INTR; regression of DINTR on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTR_1</td>
<td>1.50199</td>
<td>1.27882</td>
</tr>
</tbody>
</table>

sigma = 4.0951  DW = 2.605  DW-INTR = 0.1441  ADF-INTR = -1.1745
Critical values used in ADF test: 5%=-1.95, 1%=-2.626
RSS = 60.37148584 for 1 variables and 37 observations

Augmented Dickey-Fuller test for BD; regression of DBD on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD_1</td>
<td>-0.039344</td>
<td>0.056605</td>
</tr>
</tbody>
</table>

sigma = 2.13899  DW = 1.877  DW-BD = 0.1113  ADF-BD = -0.6951
Critical values used in ADF test: 5%=-1.95, 1%=-2.626
RSS = 16.47096574 for 1 variables and 37 observations

Augmented Dickey-Fuller test for EXR; regression of DEXR on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXR_1</td>
<td>-1.08658</td>
<td>0.72156</td>
</tr>
</tbody>
</table>

sigma = 5.1279  DW = 1.018  DW-EXR = 0.02841  ADF-EXR = -1.5059
Critical values used in ADF test: 5%=-1.95, 1%=-2.626
RSS = 9.466320959 for 1 variables and 37 observations

Augmented Dickey-Fuller test for NFL; regression of DNFL on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFL_1</td>
<td>-0.27152</td>
<td>0.16149</td>
</tr>
</tbody>
</table>

sigma = 3.18341  DW = 2.678  DW-NFL = 1.347  ADF-NFL = -1.6817
Critical values used in ADF test: 5%=-1.95, 1%=-2.626
RSS = 3.648280902 for 1 variables and 37 observations

Augmented Dickey-Fuller test for DPINV; regression of DDPINV on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPINV_1</td>
<td>-1.2456</td>
<td>0.16254</td>
</tr>
</tbody>
</table>

sigma = 1.395  DW = 1.988  DW-DPINV = 2.433  ADF-DPINV = -7.663**
Critical values used in ADF test: 5%=-1.95, 1%=-2.626
RSS = 70.05731605 for 1 variables and 37 observations
Augmented Dickey-Fuller test for DSM; regression of DDSM on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSM_1</td>
<td>-1.5133</td>
<td>-10.580</td>
</tr>
</tbody>
</table>

\[ \text{sigma} = 2.57765012 \quad \text{DW} = 2.108 \quad \text{DW-DSM} = 3.027 \quad \text{ADF-DSM} = -10.58^{**} \]

Critical values used in ADF test: 5\%= -1.95, 1\%= -2.626
RSS = 2.391931426 for 1 variables and 37 observations

Augmented Dickey-Fuller test for DGI; regression of DDGI on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGI_1</td>
<td>-1.0730</td>
<td>-6.4551</td>
</tr>
</tbody>
</table>

\[ \text{sigma} = 5.08097012 \quad \text{DW} = 2.025 \quad \text{DW-DGI} = 2.146 \quad \text{ADF-DGI} = -6.455^{**} \]

Critical values used in ADF test: 5\%= -1.95, 1\%= -2.626
RSS = 9.29386713 for 1 variables and 37 observations

Augmented Dickey-Fuller test for DRGDP; regression of DDRGDP on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRGDP_1</td>
<td>-0.37030</td>
<td>-2.86521</td>
</tr>
</tbody>
</table>

\[ \text{sigma} = 2.1316608 \quad \text{DW} = 2.192 \quad \text{DW-DRGDP} = 0.9305 \quad \text{ADF-DRGDP} = -2.8652^{**} \]

Critical values used in ADF test: 5\%= -1.95, 1\%= -2.626
RSS = 1.6358233518 for 1 variables and 37 observations

Augmented Dickey-Fuller test for DCPS; regression of DDCPS on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCPS_1</td>
<td>-0.85567</td>
<td>-5.7411</td>
</tr>
</tbody>
</table>

\[ \text{sigma} = 1.4729 \quad \text{DW} = 1.435 \quad \text{DW-DCPS} = 1.293 \quad \text{ADF-DCPS} = -5.741^{**} \]

Critical values used in ADF test: 5\%= -1.95, 1\%= -2.626
RSS = 78.09926337 for 1 variables and 37 observations

Augmented Dickey-Fuller test for DINTR; regression of DDINTR on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DINTR_1</td>
<td>-1.3024</td>
<td>-8.1756</td>
</tr>
</tbody>
</table>

\[ \text{sigma} = 3.90494 \quad \text{DW} = 1.963 \quad \text{DW-DINTR} = 2.656 \quad \text{ADF-DINTR} = -8.176^{**} \]

Critical values used in ADF test: 5\%= -1.95, 1\%= -2.626
RSS = 54.89490986 for 1 variables and 37 observations

Augmented Dickey-Fuller test for DBD; regression of DDBD on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBD_1</td>
<td>-0.96888</td>
<td>-5.7855</td>
</tr>
</tbody>
</table>

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Augmented Dickey-Fuller test for DEXR; regression of DDEXR on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEXR_1</td>
<td>-0.31080</td>
<td>-2.73447</td>
</tr>
</tbody>
</table>

Augmented Dickey-Fuller test for DNFL; regression of DDNFL on:

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNFL_1</td>
<td>-1.5400</td>
<td>-10.976</td>
</tr>
</tbody>
</table>

Critical values used in ADF test: 5%=-1.95, 1%=-2.626
RSS = 74.89574809 for 1 variables and 37 observations