

UNIVERSITY OF CAPE COAST

FISCAL AGGREGATES, GOVERNMENT BORROWING AND ECONOMIC
GROWTH IN GHANA: A DYNAMIC VAR/VEC APPROACH

BY

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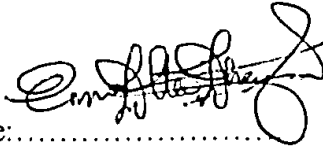
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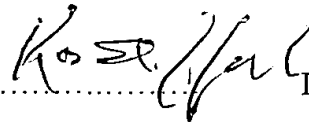
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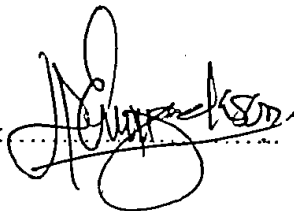


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ABSTRACT

This study focused on the relationship between methods of financing government expenditures and economic growth in Ghana using a dynamic econometric framework. In the study, we developed a two equation system with economic growth and government expenditure as the endogenous variables and seven exogenous variables –domestic borrowing, borrowing from abroad, direct taxes, indirect taxes, private investment, exports and imports. Stationarity tests indicated all variables were integrated of order one whilst the cointegration test uncovered one cointegrating relationship between government expenditure and economic growth. Using the FIML estimation procedure, we obtained the short run functions for both economic growth and government expenditure and showed that in the short run ,economic growth is negatively influenced by growth in domestic borrowing and growth in borrowing from abroad but positively related to growth in private investments and imports. In the short run, growth in government expenditure elicits a positive response from growth in domestic borrowing, indirect taxes, private investments and exports but inversely related to growth in borrowing from abroad and imports. Causality tests confirmed causation from government expenditure to domestic borrowing, economic growth to domestic borrowing and government expenditure to borrowing from abroad. Variance decomposition shows that over ninety-nine percent of all innovations due to government expenditures emanate from ownself but economic growth accounts for about eighty-four percent of the total innovations. Shocks to government expenditure from economic growth lasts for a short period but shock of economic growth from government expenditure takes a longer time to wear out.

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I must however add that if there are any errors, shortcomings and inadequacies inherent in the work, these should be attributed to me. I take full responsibility for them.

DEDICATION

To my whole family for serving as a veritable source of support and inspiration and my spiritual master and guide for giving me an insight into ones duty on the material plane

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CHAPTER ONE

INTRODUCTION

Background of the study

Fiscal policy remains one of the key mechanisms, which governments use to influence or direct the economy according to their set objectives. Since the days of Lord Maynard Keynes, fiscal policy has never ceased to be a prominent part of discussions relating to economic growth. Indeed, it is accepted that the Keynesian revolution brought far-reaching changes and new approaches to economic thinking and these have continued to exert substantial leverage on economic policy designs in many countries. According to Kouassy (1994), the Keynesian notion of growth gained currency in the third world because at the time, it was considered to be the only way to initiate and originate development having just emerged from colonial domination.

It is in accordance with this Keynesian philosophy that the post-independence government of Ghana led by Dr. Kwame Nkrumah decided to apply a development paradigm whose main thrust was to provide the social and economic infrastructure necessary for the rapid take off of Ghana's economy. Indeed according to Frimpong-Ansah (1995), the idea was for the state to hold the commanding heights so that the efficacy of a big investment push would propel the economy onto the path of growth and development.

Though in Ghana, fiscal instruments have always been at the forefront of government's attempts to teleguide the economy and ensure economic growth, it is only after independence that fiscal policy assumed a more prominent role in the scheme of the government as massive and direct state interventions were used to provide social and economic infrastructure. In the view of Wetzel (2000), this conceptualized view of development inevitably led to massive state expenditures especially in industry and infrastructure seen as critical to modernization and development. In addition to these, the state had to establish, nurture and sustain efficient civil and public services. To fulfill the obligations above and meet the expectations of the people, government eventually resorted to deficit financing. Dordonoo (2000) characterizes this practice of spending beyond the government's revenue to be predicated on the Keynesian proposition of government using discretionary fiscal and monetary policies to engender economic growth.

Dordonoo (2000) observes that as time went on, fiscal operations could only be sustained on borrowing as the country's foreign reserves dried up whilst volatile and adverse international economic environment resulted in worsening terms of trade and thus exacerbated the already existing stress on government finances. The culture of running fiscal operations through domestic borrowing thus became institutionalized and this together with overall inefficient management and the prevailing weak institutional structures led to poor economic performance especially from 1970 to 1983 during which it is reckoned that average yearly decline of the GDP was about 1.5 %.

The fiscal policy of the government from 1970 to 1983 is discussed by Aryeetey and Harrigan (2000). According to them throughout the period, the government ran a fiscal deficit policy in which the growth rate of expenditures consistently outpaced the growth rate of revenues. This view is reinforced by Franco (1979), who emphasizes that to fund the growing fiscal deficit the authorities depended on credit creation. Table 1 summarizes Ghana's economic performance from 1970-1983.

Table 1: A View of Macroeconomic indicators

YEAR	1970	'71	'72	'73	'74	'75	'76	'77	'78	'79	'80	'81	'82	'83
REAL GDP GROWTH (%)	6.78	5.56	-2.50	15.3	3.3	-12.87	-3.52	2.29	8.48	-7.82	6.25	-3.50	-6.92	-4.56
NARROW FISCAL DEFICIT (%)	-1.4	-2.3	-4.3	-7.1	-4.1	-8.1	-9.1	-10.9	-8.0	-6.6	-7.1	-6.4	-5.1	-2.5
MSGROWTH (%)	22.2	27.3	33.1	12.2	33.9	22.4	25.7	37.3	54.4	25.6	47.7	40.3	38.9	12.4

Source: Cited from Economic reforms in Ghana: The miracle and the mirage

One orientation that rationalizes the fiscal position was that the tax base kept dwindling as a result of the fall in domestic output, exports and imports as well. From 1972 onwards, the major means of financing public sector deficits were by borrowing from domestic sources especially the commercial banks and the bank of Ghana since borrowing from foreign sources were effectively out of the question because of the Acheampong government's repudiation of external debts (Aryeetey & Harrigan, 2000). Aryeetey and Harrigan (2000) calculate that between 1970 and 1983 domestic credit to the central government increased dramatically from 0.89% to 9.23% of GDP, whilst within the period, money supply growth averaged 31% per annum.

Indeed, it is generally conceded that aside of the policy choices, political upheavals caused by coup d'etats contributed to a deterioration in the state of the country's economy and all aspects of national life (Ewusi, 1986). In particular, low productivity of labour, low capacity utilization in the manufacturing sector, low agricultural productivity and declining exports had a serious impact on the economy.

By the beginning of 1983, the inappropriate macroeconomic and institutional policies combined with various external shocks had created a severe deterioration in economic performance. Symptoms of the deterioration –large fiscal deficits, high rates of inflation, overvalued currency and balance of problems were evidently manifest (Aryeetey and Harrigan, 2000). Against the background of the worsening economic conditions, the then PNDC had to come to terms with the realities and acquiesced to implement a comprehensive and far-

reaching Economic Recovery Programme (ERP) with the aim of arresting and rolling back the decades of economic decline (Jebuni et al, 1992).

With the clear objective of halting the downward slide of the economy, the PNDC supported by the IMF, the World Bank , multilateral and bilateral donors packaged ERP such that its main pillars were the stabilization of the economy, structural adjustment/shifts and eventually measures to put the economy back on the path of growth. In pursuit of these objectives, particular attention was to be placed on fiscal and monetary policy management especially to address the high rates of inflation, large budget deficits and balance of payments, the eroding confidence in the cedi and then the effects of these on export performance. As part of the ERP, liberalization of the economy was initiated and the dominant role of the government determining the expansion path of the economy was to be relegated to the background whilst the private sector was to be encouraged to take up that role jettisoned by the government. The government however was to keep its focus on its critical functions and the strategic and sensitive sectors in the economy.

The main thrust of the reforms was the streamlining of government expenditures through privatization of State Owned Enterprises (SOEs) , rightsizing public institutions and the removal of subsidies. These were all done with the view to changing the direction of fiscal policy in order to stimulate and create the impetus for economic growth, but as witnessed by even the past ERP era sustained rapid growth has proved illusive.

Statement of the problem

The government, since independence has played a dominant role in the economy. Aside of developing the necessary infrastructure, government business interests far outweighed that of the private sector. It is because of this that some scholars characterize the government's role in the economy as too pervasive in economy (Frimpong-Ansah, 1995).

In 1983 when the ERP was introduced it particularly targeted fiscal discipline as one of key measures that could help stem the economic decline. Aryeetey and Tarp (2000) in assessing the ERP raise the view that in the early part of the reforms, there were very commendable achievements regarding the management of the macroeconomic environment especially in respect of inflation, interest rate and the stability of the cedi. These achievements were however followed by less consistent and unimpressive outcomes as a result of the re-emergence of the expansionary fiscal policies especially in the 1990s, a situation that in the past contributed immensely to the negative growth rates. Durdonoo (2000) asserts that the fiscal problem /crises that gripped the government finances re-appeared after 1992 with the transition from military to constitutional governance and has continued to undermine economic growth. CEPA (2000) subscribes to this notion and observes that there is unequivocal evidence that budgetary imbalances have become entrenched and have been a primary cause of the resurgence of macroeconomic instability which slowed down growth. Economic growth has been staggering over the years since the adoption of the reforms and one of the most dominant views is that fiscal policy continues to

exert a negative impact on the economy and economic growth, even though the country accepted a change in economic management paradigm to a liberalized and market-led allocative system that thrives on the dominance and efficiency of the private sector to drive the economy.

The questions that readily come to mind are; does the fiscal policy design inhibit growth? In what ways do these happen and through which channels? How do the various methods of financing fiscal operations impact on economic growth? Are the means of financing the fiscal deficits particularly detrimental to economic growth as some suggests? (Amin, 1998 and Fischer, 1993). Indeed the question as to what ways and in what direction fiscal policy affects economic growth continues to engage the attention of growth theorists. It is in this vein that Baldicci et al (2003) reiterates the nagging issues of how do the means of financing fiscal operations impinge on growth?

Though a lot of work has been done on the relationship between fiscal policy and economic growth, they do not touch on all the important dimensions. In the literature three main lines of research regarding the above can be identified; Devarajan et al (1996) and Amin, (1998) Chletses and Rolljas (1995) assess the impact of components of public expenditure on economic growth. Al- Yousif (1998), Landau (1983), Ghali (1998), Cao and Li (2000) Dalamagas (2000), Ram Rati (2001), Lin (1994), Feder (1993), Gould(1983), Singh and Sahn (1984) and Holmes and Hutton(1990) also study the relationship between the size of government and economic growth. Other studies have focused on the effect of government's spending and revenue mobilization activities on private investment

and on growth (Chhiber and Dailaimi, 1990) whilst Odedekun (1997), Khan and Reinhart (1990) and Sarmad (1990) have concentrated on the relative effects of public and private spending on economic growth.

The common thing about these works is that all of them used the neoclassical growth model as an analytical tool and these may not necessarily unravel all the underlying relationships. According to Lee and Gordon (2004), in the neoclassical framework, growth depends on the accumulation of capital and labour hence the existing empirical work studying tax effects on investments and labour supply do not capture all the relevant effects on growth.

Thus the existing literature does not address all the fundamental issues regarding the relationship between the various methods of financing government expenditure and economic growth. The contention of the current researcher is that each method of financing may have a different effect on economic growth and the use of the Keynesian framework is better able to integrate into our system the key instruments of government financing- taxes and government borrowing and thereby attempt to address these missing links. It is thus hoped that by applying a dynamic approach to the Keynesian framework, the current research will shed new light and advance the discourse on the relationship between fiscal policy and economic growth.

Objectives of the study

The overall objective of the study is to determine how the various methods of financing public expenditures affect economic growth. The specific objectives are to:

- Assess the effect of direct taxes, indirect taxes, domestic borrowing, and foreign borrowing on economic growth and government expenditure;
- Estimate the long run and short run relationships between economic growth and government expenditure;
- Examine the effect of unanticipated random shocks to government expenditure on economic growth and vice-versa; and
- Establish the direction of causation separately between private investments and economic growth and private investments and each of the methods of financing government expenditure.

Hypothesis of the study

For the purpose of the study, the following would serve as our working hypotheses.

- Direct taxes have no short-run effect on both economic growth and government expenditure.
- Indirect taxes do not exert any short run impact on economic growth and government expenditure.

- Domestic borrowing has no real influence on economic growth and government expenditure.
- There is no long run equilibrium relationship between government expenditure and economic growth.
- The random effect of a shock in government expenditure has no impact on the long run time path of economic growth.
- There is no causation between growth in private investments and any of the methods of financing government expenditures.
- There is no causation between growth in private investments and economic growth.

Justification of the study

In contemporary times, the debate among economists over the role of fiscal policy in economic growth has assumed interesting dimensions with economists belonging to different persuasions fiercely defending their positions. To some however, this is a testimony to the fact that the subject is still under exploration.

In Ghana particularly, some economists have always blamed the poor performance of the economy on the fiscal policy that have been implemented over the years. Much of the debate has centered on the fact that the economy has been on deficit financing. In particular, reports from ISSER (2000) and CEPA (2002 and 2004) have consistently pointed to domestic borrowing as being inimical to good economic performance. On the other hand, some economists assert that it is

the use to which the borrowing to close the deficit is put which is important. Thus it would be interesting to ascertain the impact of the methods of financing the deficit on economic growth. The results may assist shape the debate on the effect of the methods of financing government expenditure on economic growth.

Significance of the study

The results of this research are intended to inform fiscal policy design and implementation. It would also serve as a basis for further work to be done to advance the frontiers on knowledge and also a source of reference to related work. It is hoped that the conclusions of the current research would provoke more researches into other relevant aspects of fiscal policy in Ghana and thereby shape the debate on the relationship between fiscal policies and economic growth and thus aid policy makers to make correct policy choices.

Organization of the study

The study is organized in six chapters. Chapter one introduces the topic and gives the background to the study. It then isolates the problem of the study and goes on to define the objectives of the study. It wraps up with justification and significance of the study. Chapter two deals with a comprehensive review of literature. It examines the theoretical and conceptual issues in the literature which center on fiscal policy and economic growth and ends up with a review of empirical literature.

Chapter three takes a look at the evolution and performance of fiscal policy in Ghana and concludes with an examination of the trends in the economy of Ghana. Chapter four deals primarily with the exploration of the various methodologies for examining economic growth and the specification of the model to be used in the analysis. It also presents the analytical framework to be used and finally describes the sources of data.

The next chapter is devoted to econometric analysis of data and presentation of results. Further, the results of the analysis are discussed whilst setting them against what pertains in the literature.

Finally, chapter six examines the results of the study and isolates the possible policy implications. The last section of the chapter focuses on the limitations of the study and areas for future research.

CHAPTER TWO

LITERATURE REVIEW

Introduction

In this chapter, we will attempt to provide all the relevant theoretical and conceptual ideas of the relationship between the methods of financing government expenditure and economic growth.

Conceptual issues relating to economic growth and the different methods of financing government expenditures

Different views regarding how fiscal policy affects economic growth can be identified from the literature. Each school of thought has a different explanation to how each method of financing fiscal deficits impacts on economic growth (Kouassy Oussou, 1994).

According to the Keynesians, a bond-financed public spending causes an increase in aggregate demand leading to an increased demand for cash balances. This excess balance available generates an upward pressure on interest rate, which in turn results in a decline in investments. However, the ultimate effect of any rise in public spending is usually determined by the interest elasticity of money demand and investments. For instance, it is concluded that public spending has a greater

impact on real output when money demand is more interest elastic and investments are less interest elastic.

On the other hand, if public spending is financed through taxes, it may generate a contractionary effect on consumption in addition to the crowding out effect. Again, to the Keynesians, if public spending is money financed the fiscal multiplier is higher since the change in the money supply will not have any effect on the interest rate. In the view of the monetarist, however, money financing triggers off inflation which itself usually undermines economic growth.

The neo classical approach is a little different. In their opinion, a rise in public spending financed by bonds will also increase aggregate demand but because of the rigidity and fixity of the aggregate supply, price levels will rise leading to a movement of the LM curve to the left. To realign the market forces, the excess money demand resulting from the above exerts an upward pressure raising interest rates. The rise in the interest rate thus crowds out private sector activity. In sum, the neoclassical adherents suggest that bond financing of public spending has no real impact on output and that the process results in price inflation and crowds out the private sector. Their view on tax financed public spending is that it causes some contractionary effects on private consumption in addition to the price and interest rate effects. The net effect on real output however is inconclusive.

It may be said that though the views elucidated by the different schools of thought provide a general framework for understanding how different modes of

financing public spending impacts on output, they may be inadequate in accounting for what happens in the open economy with four sectors.

Though it is accepted that the Keynesian and neoclassical analysis above provide some basic framework for understanding the effect of fiscal policy on economic growth, they are limited by the fact that they operate within the context of a closed economy.

Mundell and Flemming have designed an extension of this IS - LM system by incorporating into it the labour and the international markets with a flexible exchange rate. Under this when the government decides to finance fiscal operations by borrowing from the Central Bank, it leads to an increased money supply which creates a deficit on the balance of payments. Consequently, the demand for foreign exchange increases and thus creating an impetus for exports while there is an increase in money supply which precipitates an increase in price levels. The major effect of such a policy is an increase in output, rate of interest and exchange rate.

The second scenario under this system involves the use of tax instruments and borrowing from the public. In other words, if government increases taxes or borrow from the public by floating debt instruments, it enhances the real side of the economy leading to a deficit on the balance of payments. Exchange rate goes up and this helps propel exports. On the whole, output increases whilst interest rate shoots up.

A flow of resources from abroad through loans and grants has a different effect. The influx of resources pushes the balance of payment's position to a

surplus. This enhances the real side of the economy. As this happens, the system subsequently creates a deficit leading to a depreciation of the exchange rate, which also increases exports. The increased money supply generates pressure on price levels resulting in higher price levels. In sum, output increases.

The effects of taxation policy on economic growth

Lin (1994) has asserted that there are negative impacts on economic growth associated with the government's revenue raising and transfer mechanisms. Again it has also been argued out that government activities can result in the crowding – out of private investment opportunities and in some cases have a distortionary effect on productivity and growth as a whole. These distortions are emphasized by Downs (1957), Tullock (1959) and Olson (1984) as coming particularly out of government taxation policies which may produce misallocation of resources as well as disincentives and thus undermining growth. It is contended that a tax regime that causes distortions to a private agent's investments incentives can retard growth. However, if the regime is such that it leads to internalization of externalities by private agents, it may induce efficiency in resource allocation and thereby motivating investment and ultimately growth (M'Amanja and Morrissey, 2005). Levine and Renelt (1992) and Landau (1983) sum up this argument by stating that taxation ultimately creates decision making problems resulting in suboptimal resource allocation and thus stunts economic growth.

Though in the literature, there is gravitation towards one or the other view that government expenditures promote or hinder growth, there are some theoretical positions that appear to acknowledge and accommodate the two contending views. Barro (1989) and Easterly (1990) are in that category. The Barro model for example hypothesizes that at a time when government size is relatively small, economic growth increases with enlargements in government services and taxation because the positive effect of providing more public goods is prevalent. This however changes beyond the point when the harmful effects of higher taxes on the mobilization of savings and investments become manifest and actually begin to undermine economic growth.

Skinner (1988) reviews two main ideas regarding how the tax policy influences economic growth. According to one view, tax hikes have the effect of reducing current account deficits and ease budgetary pressures thereby encouraging investments and long-term growth. Further, the methods or channels through which tax revenues are raised are considered irrelevant since it is assumed that the effect of any tax – induced distortions are thought to be small relative to institutional constraints such as price controls, foreign exchange allocation and trade quotas.

The opposing view proffered is that high marginal taxes only serve to discourage work effort, strangle new investments, limit foreign trade and thus undermine economic growth.

Skinner (1988) asserts that any study which relates government fiscal policies to output growth rates must confront the theoretical problem that while

taxes and an inefficient government sector may reduce the level of GDP, it is not clear how rate of growth of GDP is affected. In his view, Skinner (1988) has emphasized that taxation and most government policies will have no effect on long – term growth rates. However, some economists have continued to ask how tax – rate can affect output growth.

One answer that is usually offered is that static tax distortions do affect output growth along a transition path of a sequenced change in the level of output by encouraging the flow of investment and labour supply into sectors which largely escape taxation. The expansion thus of these lightly taxed or subsidized sectors ultimately lead to lower overall capital and labour productivity. Hence for a given rate of investment and labour supply growth, output is likely to decline. On the other hand, if these lightly taxed sectors provide positive benefits, then they are likely to direct more resources into socially productive activities, which can augment output. However, according to this view, if the economy is on steady – state, growth path taxation will have no effect. The conclusion from the above argument is that the effect of taxation on output growth may be variant.

There are other notions regarding the effect of taxation on output growth. In relation to the effect of direct and indirect taxes, on output, it argued that direct taxes create dynamic distortions by reducing savings and investments while indirect taxation leads to static distortions though some studies suggest the opposite effects. Indeed, Kouassy and Bohoun (1994) admit that there is a body of literature which center on studies on taxation in developed countries. According to them taxes are integrated in growth models through taxation of

income and of productive activities. Thus taxation of economic activities is generally associated with allocative and efficiency distortions resulting in intersectoral resource transfers, which are likely to affect economic growth adversely. However, another argument that has been advanced is that in situations where the government is free to borrow and lend, taxes eventually have no effect on growth in the long run (Milesi-Ferretti and Roubini, 1995).

To sum up, M'Amanja and Morrissey (2005) draw attention to economic theory which suggests that the nature of a tax regime can foster or harm economic growth. We thus say that the design of tax and spending policies are crucial and critical to the growth process.

Borrowing from abroad and economic growth

Foreign borrowing has been touted as a better source of financing of economic growth than domestic borrowing because it argued that it is less distortionary than the latter. Foreign borrowing according to the neo-classical Solow (1956) growth model acts to increase capital accumulation and since output per worker is a function of the capital per worker and increasing capital per worker, *ceteris paribus*, it results in higher growth achievements (Bawumia, 2001). But this assumption inherent in the Solow model is called into question by Moseley et al (1987) who argued that foreign aid may not necessarily result in an increase in investments. This because governments may reduce their own budgetary allocations for capital projects in response to the aid inflows or aid flows may even provide a disincentive to the government's revenue generation

efforts. This latter position is underlined by Njeru (2004) who states that there is a growing conviction among donor agents that the aid process is usually undermined by the ability of the of the recipient government to alter spending patterns to subvert the sectoral distribution of expenditure for projects. Griffin (1970) also says that there are channels through which aid may lead to a decline in saving and these may either affect government expenditure patterns or revenue generation.

Foreign aid and borrowing from abroad have emerged in the growth and the fiscal response literature. But in Africa, according to M'Amanja et al (2005), borrowing from abroad has not been integrated into the body of research involving how the important sources of revenue affect output growth. Aid is clearly underlined by McGillivray and Morrissey (2000) as a very strong factor that influences the fiscal behaviour of recipient countries. They further extend the argument by stating that the multiplier effect of such inflows into African economies is largely overlooked in the literature.

Relating to borrowing, there are some who believe that aid or foreign borrowing may allow a country to overcome its capital constraints and thereby create an avenue for economic growth .Apart from that since foreign aid normally comes with expert advice or technology transfers it has the tendency of engendering economic growth. In addition, foreign aid according to Bawumia (2001) may also help countries to re-build or even add to their physical infrastructure. This however contrasts with the view that aid leads to a decline in savings and thus undermines capital formation and ultimately economic growth.

According to Heller (1975) and later Moseley et al (1987), foreign loans may succeed in reducing domestic borrowing and taxation while increasing government consumption (defined to be unproductive) and decreasing government investment which tends to be more pro-growth in nature. Bacha (1990) reinforces the point that foreign aid tends to relax the constraints on investments by making it possible to import requisite capital for various activities and reducing the need for seignorage or capital from domestic money and capital markets.

Chenery and Strout (1996) and Griffin (1970) see the role of aid as filling the foreign exchange gap. Goumane et al (2005) have also argued in line with those who believe that aid has a beneficial effect on economic growth but Elbadawi (1999) points to the fact that aid may lead to exchange rate appreciation which eventually undermines growth. There is also the issue of the so-called Dutch Disease phenomenon which is said to lead to the appreciation of the exchange rate and thereby lower exports and ultimately low economic growth. This is emphasized by Younger (1992), and Vos (1993).

In addition to these, other arguments have been advanced in lieu of the efficacy of foreign aid in the long term. The most prominent of these is that which sees aid as a factor that slows down growth in the long run. This is because aid and borrowing from abroad impose a burden on government finances in the form of interest charges and debt servicing on future generations (Krugman, 1988 and Bulow and Rogoff, 1989). In the view of Bawumia (2001), the arguments can

rage on but in the final analysis, aid can either be beneficial or not depending on domestic policy environment and how it is eventually applied.

Domestic borrowing and its impact on economic growth

Domestic borrowing has been an accepted means of financing since Keynes's General theory and played an important role in the economies of a lot of countries, including the advanced countries. Indeed domestic borrowing is regarded as an avenue through which governments can effectively and systematically mobilize and channel idle resources into investment in order to speed up the pace of economic growth.

It has been argued that this method of raising resources to finance government activities tends to starve the private sector of resources to enhance their productive activities. This may be so because most private financial agents see the government securities as a better investment alternative as it is high yielding and risk free and thus assures investors of the steady flow of returns as against directing them into productive entities as additional resource which would allow the expansion of their activities, something they perceive to be less attractive in relation to the former. Durdonoo (2004) expresses the same view when he contends that on theoretical grounds domestic borrowing results in crowding out through increased interest rates and this makes it impossible for the private sector to take advantage of the physical infrastructure which have been put in place by the government. Ashong (2004) restates this point and further

argues that domestic non-bank borrowing could be contractionary if the output elasticity of private investments is higher than what obtains in the public sector.

Money financing of government expenditure is said to lead to an increase in the monetary base and hence money supply and thus constitute a source of inflationary pressure (Ashong, 2004).

Just like foreign borrowing, domestic borrowing tends to pile up debts for the future both in terms of interest or principal payments and thus has the potential to stagnate economic growth in the long run.

In conclusion it would be appropriate to say that frequent and arbitrary use of domestic borrowing as an instrument for financing government expenditure especially from monetary sources has a tendency to fuel inflation which works to retard economic growth. It also starves the private sector of needed investments especially when it is done via non-bank sources and thus undermines growth in output.

Empirical literature review

The macroeconomics of public sector deficits – a case study of Ghana was authored by Islam and Wetzal (1991). The paper's main objective was to investigate fiscal deficits and assess their effect on both the financial and the real sides of the economy. To evaluate the effects of economic policy on public sector deficits, an array of tax revenue functions are used to ascertain the determinants of direct, indirect taxes, export and import duties. In addition to these functions, the researchers included specification for money demand and demand for quasi –

money. From the revenue equations, the results obtained shows that direct taxes depend directly on the level of GDP. Whilst inflation is negatively related to direct taxes, Indirect taxes are also found to be positively related to inflation. On the other hand, import and export duties are found to be significantly determined by the volume of imports and exports respectively. Analysis of the monetary sector showed that lag of quasi – demand for money, inflation and GDP all significantly influence quasi L- demand for money. To examine the situation on the real side of the economy, Wetzel and Islam also defined consumption and private investment equations with the view to ascertaining the effect of fiscal deficits on them. On the consumption side, they realized that only the lag of consumption and disposable income are significant. All the other relevant variables were found not to be of any consequence to consumption. From the investment analysis, it is evident that the public sector investment crowds out that of the private sector. It is clear from their results that credit to the private sector undoubtedly impacts positively on private investment. Corporate taxes were surprisingly found to be positively related to private investment.

In the external sector, the steady state determinants of black market premium and the real exchange rates are considered. Secondly, they take a look at the non – steady state regression results for both the trade surplus and the official real exchange. A dynamic equation for steady state average black market premium is analyzed and the results show that aid flows are not particularly significant in determining the black market premium but terms of trade and the fiscal deficit are significant. This means that a higher fiscal deficit causes an

increased black market premium for the foreign exchange. A regression of official real exchange rates against real exchange rates, terms of trade, fiscal deficits and aid flows yield fiscal deficits and aid as the most significant. Indeed from the results, fiscal deficits are by far the most important variable that affect exchange rate.

Islam and Wetzel also consider the non – steady state situation in the external sector by running 3 regressions with the trade surplus, black market premium and real exchange rate. The estimations show that terms of trade and the public sector expenditure significantly affect trade balance but the private sector wealth is not an important factor in determining trade balance. The only variables that are shown to be significant for the black premium equation are the public sector expenditure and stock of wealth. On the other hand, the real exchange rate is determined by the stock of privately held foreign assets and the public sector expenditure. In a nutshell, the major conclusions from the study are that public sector deficit has a pervasive impact on the economic sectors.

Fiscal policy and private investment in developing countries: Recent Evidence on Key selected issues was authored by Chhibber and Dailaimi, (1990). The main concerns of the study were to determine the relationship between stabilization measures through aggregate demand management and investment aid, how fiscal policy relates to private investment that is the ways in which fiscal policy either promote or undermine the private sector. An inequality that measures that relationship between capital income taxation and forms of finance is incorporated in the model. Specifically the analysis indicates that after

tax return on one unit of capital on different forms of finance is highest when capital requirement is met by borrowing followed by retained earnings whilst financing by share issues to companies and individuals follow in that order. Again on the rate of return on a standard project, the parameter that yields the highest real return is the corporate income tax followed by the rate of inflation whilst nominal rate of interest and rate of economic depreciation follow in that order. The clear conclusion from the paper is that fiscal policy plays a central role in determining the size of private investment. In particular, since there is limited availability of foreign capital, there often is a direct competition between the public and the private sector for these resources.

The study by Skinner (1988) focused on taxation and output growth in Africa. Its main purview was to establish the relationship between taxes and output growth. The model specifies a function of government and private inputs, which determined quantity of output in a taxed and untaxed sector. This is developed into a tax interacted or linear model based on the existing Rati Ram's growth equation. The conclusions that come out of the study are that taxes can affect output by reducing the marginal productivity of capital and labour and reducing the supply of capital and labour. Again, since government expenditures provide positive benefits, the distortions that may be induced by taxes may be justified by the positive benefits of government programmes financed by the additional revenue.

Kouassy and Bohoun (1994) studied the fiscal adjustment and growth in Cote d'Ivoire. The motivation for the study was to determine the effects of fiscal

deficits on macroeconomic aggregates and the relationship between public spending and private sector activities. Developing from an investment growth model a private investment equation is specified together with potential output equation and of fiscal deficits. In the model, private investment is expressed as a function of government investment and consumption spending, various taxes on domestic productive activities, exchange rate and interest rate whilst a fiscal deficit equation is used as a proxy for fiscal policy and defined as a function of the expenditure , tax and other revenue instruments.

In addition to this system, an equation to isolate the determinants of capacity utilization was also presented to make the system complete. From the econometric and simulation results, fiscal deficits is negatively linked to output whilst investment is shown to be very significantly and directly related to output. The results also show significant crowding – in effect of public investment on private investment. The crowding – in effect of public consumption on private investment is even more remarkable. Surprisingly, taxes on domestic activities draw a positive response from private investment but gate taxes induce a negative effect. The estimations generally showed that both government consumption and investment expenditures are positively related to the fiscal deficits .However the revenues and taxes are negatively related to the deficits.

M'Amanja and Morrisey (2005) researched into fiscal policy and economic growth in Kenya. Their main aim was to investigate the effects of elements of fiscal policy on economic growth with particular reference to

productive and unproductive government spending and distortionary and non-distortionary taxes.

Providing a theoretical analysis of the different types of government spending and taxes, they formulated a vector autoregressive (VAR) distributed lag single equation model involving non fiscal variables-output, per capita income, aid private investment and fiscal variables-unproductive government consumption, productive government consumption, government investment, direct and indirect taxes. Test showed that the variables were co integrated .In the long run most of the variables were found to significantly affect output growth with the exception of non-distortionary tax revenues. The short run results also confirm that unproductive government expenditure and non-distortionary tax revenues have no short run impact. Direct tax revenue has both a long and short run impact on output growth but a government expenditure surprisingly fails to register a significant response from output especially in the short run. Private investment on the contrary produces a significant impact on output in the short and long run. In the long run increase in foreign aid elicits a negative response from output but it exerts no significant influence on output growth in the short run.

In foreign aid investment and economic growth in Kenya using a time series approach by M'Amanja and Morrissey (2006), attention was focused on assessing the effects of aid investment and trade on economic growth using a multivariate VAR modeling. Tests for co integration yielded two co integrating vectors which were normalized on output and private investment. The long run

output relation appeared to conform to the expectations. Government and private investments were positively related to output but aid (loans) responded negatively to output. The long run relationship for private investment showed that aid has a positive effect. In the short run private investment, aid and the error correction terms significantly affect output whilst private investments shows a significant impact from imports, the structural dummy and the error correction terms. The error correction model for government investment showed a significant response to change in private investment, imports and the adjustment terms.

M'Amanja, Lloyd and Morrissey (2005) examined the relationship among fiscal aggregates, aid and economic growth using a vector autoregressive analysis. Applying an autoregressive distributed lag model with four endogenous variables, the researchers tested for co-integration and confirmed that there were two co integrating vectors in the series which were used in deriving the long run equations for output and aid.

The long run output equation indicated that government expenditure and grant were positively related to output but loan impacted negatively on it. The other long run relationship showed that an increase in government expenditure results in a more than proportionate increase in loans but increases in tax revenue and grant result in more and less than proportionate decline respectively in loan. In the impulse response analysis, it is shown that the two co integrating vectors converge to their long run equilibrium within a period of ten years when they are affected by shocks emanating from the whole economy.

A shock in government expenditure triggered explosive responses from loans, tax revenues and grant. However its demonstrated effects on tax revenue and output were minimal. The impulse responses from output, government expenditure and tax revenues when affected by shock to aid/loans were all negative.

The impact of foreign aid on public expenditures: The case of Kenya by Njeru (2004) sought to add to the existing stock of knowledge regarding fiscal response to foreign aid in Africa. The main thrust of that paper was to ascertain the effect of aid on public expenditure and assess its impact on government tax revenue. Starting from government welfare utility function, he generated a system of linear expenditure equations which make foreign aid a determinant of government expenditure. The author then applied dynamic framework in the analysis to assess the short and the long run relationships. The empirical results indicated that in the long run, foreign aid does not influence government expenditure. However short run estimation showed that recurrent government spending responds positively to foreign aid and domestic revenue/resources.

A similar research by Almayehu (1996) focused on the fiscal response to external finance in Africa. Its principal pre-occupation was to examine the influence of the flow of aid funds on the fiscal posture in African countries. Deviating from the utility maximization approach, Almayehu adopted a decision making framework which allowed simultaneous specification of direct and indirect tax and government expenditure functions with a closure equation.

Using dynamic analysis, the author found that the three endogenous variables are co integrated. In the long run economic activity is found to have significant effect on direct taxes. The impact of capital flow on direct taxes is negligible in the short run. For indirect taxes, a short run analysis showed that private consumption is very influential but foreign capital flow has no influence.

The response of government expenditure to changes in foreign inflows and indirect taxes are very strong. A major finding from the study is that capital inflows tend to affect direct taxes and hence has a dire implication for income distributions.

In the study by Hjelm (2001) on the dynamic response of the budget balance to tax, spending and output shocks in the US, it is found that government expenditure shocks are permanent and exert a negative impact on the budget deficits in the long run. Hoppner's (2001) pre occupation was a VAR analysis of the effects of fiscal policy in Germany. The main conclusion emerging from the study is that tax shocks elicits a negative response from output growth but a positive response from government expenditure.

CHAPTER THREE
THE EVOLUTION AND PERFORMANCE OF FISCAL POLICY IN
GHANA

Introduction

This chapter primarily traces the evolution of fiscal policy in Ghana from the pre-independence period to the period of economic breakdown in the late seventies to the early eighties and from the reform period to the present. It assesses the political and the social milieu /environment and proceeds to examine economic growth within the context of the various fiscal policy regimes.

A political economy of Ghana---An assessment of the political environment

Before Ghana attained independence the colonial government in place did not have any well thought out development framework as such; but they seemed to be interested in providing basic infrastructure in areas of relative economic importance to them. Again, they focused on the development of export crops and minerals which they thought were to provide them with money.

After independence, the government of Dr. Kwame Nkrumah decided to apply the principles of contemporary development economics at the time so as to enable the country achieve rapid growth and development within a short time.

According to Killick (1978) the major theme of development economics at time was that the developing or the underdeveloped countries needed what was described as the big push approach to development. In response to this policy prescription, state interventions became rife and popular as it was reckoned that it was only the state that could provide that "big push". It is in this vein that Ghana's development policies came to be anchored on that philosophy. However, Nkrumah's application of the development theories seemed to be influenced by his ideological affinity for socialism, nationalistic zest and the drive for rapid indigenization (Killick, 1978).

The main objective of the Nkrumah government was to use industrialization to pull the country along the path of rapid growth. The Import Substitution Industrialization (ISI) was initiated and that saw a lot of industries spring up in various parts of the country. Industrialization became the priority and therefore all efforts were directed at it. Gyimah-Boadi and Jeffries (2000) underlined this when they assert that the industrialization drive by Nkrumah was financed by milking the cocoa sector and partly by contracting large external loans and in their view, the eagerness to satisfy Ghanaians in general and the party faithfuls in particular sometimes overrode explicit economic consideration and this accounted for over manning and mismanagement of state owned enterprises. Political interference and other factors like the zeal to please people combined to undermine the State Owned Enterprises (SOEs) and hence most of them failed to deliver on the specific goals they were to achieve. Indeed as intimated by Seidman (1978), most of these enterprises proved inefficient and

unprofitable and thus became a burden on the public finances. Nkrumah's development plans suffered a jolt when a fall in the cocoa production coincided with a drop in the world market prices for the commodity in the 1964/65 season. This threw out of gear government's plans and created a gaping hole in the government budget. Government resorted to borrowing from abroad and import controls which eventually led to abuses of policy and pervasive corruption exacerbating the welfare costs associated with ISI.

In a sense, it may be argued that the failures identified with the development approach stemmed from the overbearing hand of the state. Killick (1978) in summing the period of Nkrumah says during the era, there was modernization with very little or no growth and development.

The 1966 coup came on the premise of economic salvation and at a time when people were getting disillusioned with the prevailing development orthodoxy. The new government appeared to favour the return to the market oriented growth paradigm. The economy was taken through a shock treatment and one of the most prominent policy choices that was made by the then government was to divest a number of states – owned enterprises and also attempt to loosen the state's control of the economy. However, as indicated by Gyimah – Boadi & Jeffries (2000), the NLC along the line became deterred by political considerations and could therefore not proceed with the reforms and liberalization that they started off with.

In 1969, Ghana returned to constitutional government with a Progress Party government led by Dr. K. A. Busia in place and in the view of Austin and

Luckham (1975), this government showed more commitment to liberalization and deregulation but as observed by Frimpong – Ansah (1995), the 1969 elections because of its conduct did not give Busia enough political authority and legitimacy to continue with the reforms begun by the NLC. Thus the government was initially unprepared to take far-reaching measures, which they reckoned could have serious political repercussions. In 1971 when they did muster courage to introduce some austerity measures, it triggered problems for the government.

The industrialization policy of the Busia government was said to be very similar to that of Nkrumah but the only difference was the gradualist approach in this era. Chazam (1988) demonstrated that the Busia regime also resorted to some urban – biased policies to consolidate his power and protect his future. However, in 1971, the decision to implement tough measures incited the people against the government and in January 1972, the military rode on the crest of public discontent to overthrow the civilian government.

The Acheampong government presented itself as nationalist in character and in line with this prepared economic policies based on national self – reliance. In furtherance of the economic goals, the state took majority shares in the large foreign business in mining, construction and manufacturing (Jeffries & Gyimah – Boadi, 2000).

To give meaning to the nationalism that they preached, the government established laws that sought to ensure a transfer of all major and important businesses in the economy to Ghanaians. In agriculture, they launched the “Operation Feed Yourself” and succeeded in mobilizing virtually the whole

populace in some kind of agricultural activity, with some measure of success. The policy was prepared with a system of incentives and subsidies, which were put in place to encourage farmers to boost production. However, as the system of price controls held sway, the farmers enjoyed little benefits from their toils and in the end smuggling of products was taken to different levels. Simultaneously underground or parallel markets emerged. It is believed that up to one – third of the national output passed through the parallel market. The cocoa industry bore the brunt of the government's inappropriate pricing and general economic policies. As a result, cocoa production plummeted to a low level culminating in a low export of 277,000 tons in 1977 – 78 from an average of 430, 000 tons in 1969 – 72 (Mansfield, 1980). The persistence of government with its policies seriously undermined the macroeconomic environment. Inflation rose to the roof whilst the exchange and interest rates were ridiculously over valued and seriously repressed. The decline in people's real incomes created an intricate system of corruption which permeated all spheres of activity. This gave birth to the phenomenon of Kalabule, a cliché describing embezzlement, corruption and cheating by market women as well as government officials (Ocquaye, 1980).

The productive base of the economy became eroded as people found it easier and very profitable engaging in distributive retail activities. The free fall of the economy continued as it posted negative growth rates.

In 1978, the Acheampong regime was forced out of office in a palace coup led by Lt. General. Fred Akuffo. They set up SMC II and immediately initiated some liberalization and devaluation measures, which were widely seen as

cosmetic and superficial. The excessive patronage, embezzlement, corruption and cheating continued to hold sway whilst the inappropriate and the urban biased policies dominated. The economic run down went on and it came as no surprise to many critical watchers when a junior officers' mutiny led to the overthrow of the Akuffo government.

The AFRC led by Flt. Lt. J.J. Rawlings, which was set up, embarked on a moral crusade against exploitation, profiteering and corruption. Some of the people who benefited from the old order were punished or gaoled. However, in sum the brief stay of the AFRC makes it difficult to associate it with any distinct macroeconomic framework.

The PNP government led by Dr. Hilla Limann that took over as constitutionally elected government after elections presented itself as somewhat of a liberal and market orientation with ideological leaning toward social democracy. One of the main aims of the government was the rationalization of government finances and prudent fiscal management through increased taxes and reduced government expenditures. In addition, the government sought to create the right conditions for attracting foreign investments. According to Jeffries and Gyimah (2000), one remarkable thing about the Limann government was its obstinate refusal to embark on economic reforms as were being demanded by the IMF and the World Bank. As Limann came face to face with the economic breakdown, he also had to deal with serious internal contradictions and conflicts in his party. These coupled with the searing, suffocating economy and corruption in the government increased the disillusionment of the masses, which again

played into the hands of the military which took over the reins of power. The PNDC led by Flt. Lt. J.J. Rawlings burst onto the scene. Initially the PNDC espoused a radical brand of ideology at the core of which was state activism and because of the revolutionary fervour that the uprising carried along, a sizeable portion of the youth lent their support. Many young ones particularly those in the secondary and the tertiary institutions joined groups which mobilized to engage in evacuation of both food and export items from the hinterland as well as helping the rural folks with development projects. Price controls were instituted and hoarding, profiteering and corruption were made criminal and punishable. The lifestyles of workers and business were subjected to critical scrutiny. To deal with the spiraling inflation, the PNDC embarked on the confiscation of ₵ 50.00 cedis notes and company accounts & individual accounts thought to be much were frozen. In a sense, Jeffries & Gyimah – Boadi (2000) describe the policies of the early PNDC era as perfectly consistent with the philosophy of economic development and the brand of development strategy that blends a measure of economic nationalism, Pan – Africanism and some tenets of socialism.

All this time, the PNDC had categorically sworn to have no dealings with the Bretton Woods institutions. However, in 1983 there appeared to be a change in ideological and philosophical direction as the government embraced economic reforms it had refused to accept earlier. According to Bates (1981), the apparent change in direction may have been informed by the failure of the urban – biased policies which had become politically irrational and which over the years had not been able to resolve the deep crisis that gripped the Ghanaian economy. The

economic reforms were started with the liberalization process involving series of devaluations of the Cedi and the institution of private forex bureau to help in the marketing and exchange of currencies to stamp out the underground market which undermined the official economy. Price controls were removed and government embarked on deregulation leading to privatization of unprofitable state owned enterprises and the reduction of the government's business interests. Very liberal investment and trading codes were enacted to ensure a stream of foreign investments. Though the reforms involved some painful measures, it is reckoned that it managed to take the Ghanaian economy out of the rapid decline. Through to date, the commitment to market led paradigm has remained quite strong and it does appear that the advent of the 4th republic and political liberalization has deepened the deregulation processes. However, the problem that has been associated with this era of constitutionalism has been the lack of fiscal prudence and as a result economic growth has not been as desired.

All through the years, it can be said that the political economy Ghana seemed to have been dominated by the orthodoxy that emphasized the overriding role of the state in the economy and it is this that has underlain the growth of the public sector and public expenditures and which have partly been responsible for the economic predicament.

Fiscal policy before independence

Before the independence era, the policy of the colonial government was to pursue a programme of calculated infrastructure development that enhanced their

ability to exploit the resources of the Gold Coast. The strategy of the colonialist therefore targeted particular areas, which were key to their trade policy, making sure that money was found to develop these infrastructures. This philosophy captured in (Guggisberg 1924: 41) "A country can develop trade to its full paying capacity without incurring a debt for the construction of the necessary infrastructure". Though the British were minded by this philosophy, they were cautious and careful not to upset a budgetary balance.

One of the central points of the colonial fiscal policy was as much as possible to discourage external debt accumulation through borrowing and increase taxation and private saving necessary to enhance productivity but not undermine it (Frimpong-Ansah, 1995). According to the Guggisberg policy, higher taxation was to be effected in a way that it could still generate higher levels of output and productivity in food production such as to absorb the higher income levels generated by the higher levels of domestic public sector spending.

In conclusion, it may be said that the fiscal policy of the colonial governments focused on limited infrastructure development and that seemed to coincide with their objectives.

Fiscal policy between 1957 and 1983

In pursuit of the governments avowed aim of ensuring a rapid transformation of the economy, public expenditure increased dramatically year after year during early years of independence. Against this background, deficits

on the budget started emerging in the late 1960s. This state of affairs appeared to worsen as terms of trade turned adverse thus weakening the tax base.

The period 1970-83 is described as a disastrous one for Ghana. This is because the period saw a rapid decline in all the sectors of the economy. Perhaps this decline may have been reflection of the fiscal crisis that gripped the country. An examination of the government finances shows that within the period mentioned, the budget registered deficits for all the years. According to Durdonoo (2000), from 1971 to 1976/77, the deficit as a percentage (%) of the GDP increased from 4.37% to 13 %. After this period the deficit continued to decline in percentage (%) terms and in 1983, the deficit was calculated to be about 3 % of GDP. As already observed, the major factors that contributed to the budget deficits were adverse international trade conditions and a general slow down in economic activities in the country as well as to some measure poor domestic policy designs and apparent misalignment of the cedi vis-à-vis the major international currencies.

In the 1990s, the adverse terms of trade led to a regime of external borrowing, which created persistent balance of payment problems for the country. Indeed, because of the adverse terms of trade, current account balance has continued to show a deficit and as a result there has been pressure on public sector account, which is consistently saddled with huge interest and service payments. This is illustrated by Durdonoo (2000). According to him, over the period 1970-83, foreign interest payments as a proportion of total recurrent expenditure persistently continued to increase. The interest and amortization payments

actually rose from about 15 % in the 1970s to over 20 % of recurrent expenditure in the early part of 1980s.

The natural or the inevitable consequence of the worsening of the terms of trade was a sharp downturn in taxes on international transactions as compared to taxes on domestic activities. By 1982, the proportion of taxes on domestic activities and that of international transactions had whittled down to 2.4 % and 0.9 % respectively. The exchange rate misalignment contributed in no small measure to this state of affairs. It was only in 1982 that an attempt at correcting the exchange rate misalignment appeared to have had a positive effect on taxes on international transactions.

With the consistent decline in economic activities, there was a collapse of a lot of businesses, which in turn accounted for the persistent dwindling proportion of taxes out of GDP. It is calculated that real revenue income fell from ₦ 5,349M in 1970 to ₦ 4,747M in 1983 using 1975 constant prices. This aptly describes why government finances suffered a jolt thus contributing to an increase in the fiscal deficit. Working within a climate of a declining reserve base whilst having to pursue its public sector activities, government largely depended on the monetary sector to continue its programmes. In this direction, monetary instruments became very prominent on the government's agenda. In particular seigniorage and high treasury bill rates were used as means of meeting expenditure targets or curbing excessive increases in money supply so as to stem the tide of inflation. These developments had a spiraling and rippling effect

throughout the economy. It undermined the productive capacity of the economy and thus contributed immensely to the fiscal problems the country experienced.

The policy of controlling prices and exchange rate added further impetus to the already precarious economic situation by causing exchange rate misalignment and eventually further eroded the country's external competitiveness, and government's ability to mobilize revenue.

An examination of fiscal policies during the period under review showed a familiar feature that is expansionary fiscal policies in which there was a growing public expenditure whilst mobilization of revenue persistently and consistently lagged behind. This was conditioned by the prevailing economic circumstances that saw a consistent and steady decline in purchasing power which led to wage agitations that were largely acceded to by the government.

In a nutshell, we have to say that over the period under review, fiscal policy was problematic. Fiscal deficits have been a dominant feature. These in combination with other inappropriate economic and institutional measures created the apparent economic debacle. By 1983, the economy's decline was monumental and therefore was in dire need of some rescue measures.

Economic reform and fiscal policy after 1983

The underlying causes of the economic malaise gave rise to extremely difficult problems. These problems on hand seemed to have been exacerbated by other factors including the drought situations in the early eighties and the need to re-settle close to a million Ghanaian returnees from Nigeria.

With these staring in the face of the government, the PNDC resolved to embark on reform programme called the Economic Recovery Programme. This programme included austerity measures meant to curtail the deceleration and eventually put the economy back on track. Among the aims of the ERP, the prominent ones were:

- Restore the country's competitiveness in order to reduce the Balance of Payments (BOP) deficits.
- Rationalize government finances by improving revenue mobilization, streamlining and reducing government expenditures and hence public sector deficits.
- Redefining the role of the government in the economy and thereby whittling down government's hand in productive activities.

Since the main thrust of the recovery programme was reducing public sector deficits, privatization became the overarching mechanism for regulating the economy. In this direction, government's commitment to the state owned enterprises was scaled back through divestiture of enterprises that were not viable.

To help address the fiscal imbalances in government finances, major policy tools applied were; the overhaul of the tax collection system, retrenchment and redeployment of workers on the government's payroll to reduce the underemployment of the labour that generally existed in the public sector, credit controls, retirement of government debts to the banks and an overall restructuring of the financial sector. In addressing the high public expenditures, certain key problems were targeted. The main ones were:

- Over-staffing in the public enterprises and the rising wage bill.
- Wastage in the public sector and the recurrent heavy losses of the State Owned Enterprises (SOEs).
- Fraud in the accounting procedures in the public sector and
- Lack of accountability and corruption in the public financial systems.

In response to these, government instituted strict policy measures among others; the introduction of strict expenditure monitoring and control to reduce the incidence of financial irregularities and fraud in the system.

In short all the measures adopted to keep the fiscal balance in check were predicated on the pillars of improving revenue mobilization whilst keeping government expenditure in a check. Indeed, according to the ISSER (1999), in the period 1983-1991 the change in fiscal focus paid dividends as fiscal deficits declined steadily during the period. The fiscal balance in 1987 started showing positive. This trend continued up to 1991. The dawn of constitutionalism in 1992 however truncated this trend as fiscal deficits started re-emerging. It is interesting to note however that though the prevailing policy was toward reduction in government expenditure whilst enhancing the revenue base, the positive fiscal balance was not attained at the expense of government expenditure. Rather on the contrary, there was a steady increase in government expenditure. This is illustrated here. For example in 1983 the total government expenditure as percentage of nominal GDP was 8 %. By 1986, it had shot up to 13.8 %. This shows that there was a steady increase in government expenditures from 1983 to 1990. Within the period, it was only in 1990 that there appeared to

be a slump in government expenditure as it dropped to 12.5 %, a value below the average value recorded during the entire period under consideration. A further analysis of trends in government expenditure reveals that the rise in total expenditure was accompanied by a decline in public consumption expenditures. Total consumption expenditure was 22.3 % of total government expenditure but this dropped to 16 % in 1986. One implication of this trend is that government had been appropriating less and less of the flow of goods and services to itself. Again, this means that government capital expenditure had been rising faster than government consumption expenditure, which is consistent with government policy of promoting and increasing the role of the private sector in the economy.

Trends in government revenue (1970-83)

Over the period under discussion revenue generation was problematic. The major reason for the state of affairs was obviously as mentioned; the prevailing economic circumstances i.e. the downturn in economic activity as well as adverse external economic and trade climate. As a result of these factors, total revenue comprising tax and non-tax revenue registered a consistent decline in both real terms and as a proportion of total output. This is clearly shown when observes that in 1970, total real revenue was ₦1, 184.52m but by 1983 this had reduced to as low as ₦ 264.15 million. The downward slide of revenue was particularly due to sharp drops in the returns for taxes on income and property as well as international transactions. Taxes on domestic goods services also dropped but not as sharp as in the above.

According to Durdonoo's (2000) calculations, taxes on income and property fell from 2.8% of GDP to a mere 0.98% of GDP in 1983 whilst tax revenue from domestic activities was down to sub one percent in 1983 from approximately 5% of GDP. Proceeds from international transactions also dropped from 12% in 1970 to 2.7% in 1983.

In sum, it would suffice to say that generally revenues during the period consistently declined as tax proceeds also continued to dwindle as a result of declining economic activities and tax evasions.

Revenue trends (1984-1995)

The inception of the economic recovery programme (ERP) brought with it far-reaching and revolutionary ways of approaching government financial management systems. One of such systems, the tax administration underwent a serious streamlining and overhaul in the period under review. There was a conscious effort to improve the efficiency of the tax and other revenue generating institutions. Added to this was the fact that economy started to witness real signs of revival in all the various sectors.

As a result of the above, the period 1984-95 recorded a dramatic improvement in revenue collections. From a low of about ₦ 431.63m in 1984, it climbed to ₦ 2321.22m in 1995 in real terms. In other words in real terms, revenue shot up from 8.4% of GDP, to about 27% of GDP in 1995.

Prior to the period above that is between 1983 and 1990 total government revenue increased by more than 26 times. Of the non-grant sources, taxes on

domestic activities registered the highest rate of increase, exceeding the 1983 level forty times. However, personal tax revenue fell in 1988 but regained grounds in 1990 when it exceeded fourteen times its level in 1983. Again taxes from foreign trade and transactions in 1990 were 18 times the 1983 level whilst taxes on income and property in 1990 topped 30 times the level in 1983.

One of the striking features of government revenue is its composition. The composition of revenue reveals some interesting trends. For example in 1983 as much as 82.7% of total government revenue came from taxes with the non-tax component accounting for 17.1%. The rest, less than 1% came from grants. But with the launching of the ERP, there came a shift in composition. In 1990 taxes still retained its dominance as the major source of government revenue. However non-tax sources of revenue was supplanted by grants as the economic reforms progressed and actually contributed 10% of total revenue in 1990. Before this period, there appeared to be a fluctuation of the tax and the non-tax components. On the other hand, the increasing significance of the grant element reflected a certain position; that is that external confidence continued to grow in the economy as the ERP was being implemented and also as a result of the desire of donors to assist with the recovery efforts.

Again it is clear that for the period before the reforms were launched, the country derived majority of its revenue base from foreign trade transactions whilst taxes on domestic activities and on income together accounted for about 42% of the total. However with the launch of the ERP, there was a shift in composition. Total taxes generated in respect of foreign trade amounted to 42% of the tax

revenue in 1990 whilst that on domestic goods and services increased to a whopping 34% of total tax revenue. This was accompanied by a similar increase in income tax though not as remarkable an improvement as witnessed in the domestic goods and services; 34% of total tax revenue.

Within the subgroups themselves, changes have occurred with respect to composition. Taking taxes on foreign transactions, the transformations led to a decline in the share of export duty, whereas the shares of import duties have increased. The changes are clear when one takes a look at the figures. It is calculated that export taxes contributed about 60% share to total revenue from foreign trade. However as the economic reforms progressed, its contributed share consistently dropped. By 1990 the export tax share had gone down to around 29%. As export share reduced in influence, import taxes gained in prominence, thus from 38.5% in 1983 it climbed to about 71% in 1990. According to researchers, this may be attributable to the strong new exchange rate and liberalization policies, which were part of the ERP.

Another sub category is the tax on domestic goods and services. It has three main sources- excise duty, sales taxes and petroleum taxes. In 1983 the bulk of the tax on domestic goods and service was derived from excise taxes. Infact, excise taxes contributed about 86.5% whilst sales taxes accounted for roughly 11% of the proceeds of taxes on domestic goods and services, however with the progress of reforms some change began to show. An attempt to streamline and administer taxes paid dividends as the share of sales taxes in taxes on domestic and services began to shoot up. By 1990, sales taxes share to taxes on domestic

goods and services amounted to 32.2%. One interesting feature is that the share of petroleum taxes also saw a consistent increase generally. But by 1990 it had overtaken the others and contributed about 35% as against 32% contributed by sales taxes and 31.3% by excise duty. Regarding income and property taxes, there have not been any remarkable or striking changes in terms of composition between the periods 1983 and 1990. The only thing worthy of note is the fact that company taxes from the figures registered a steady increase from about 45% to 63.3% in 1990 which happening is generally explained by the prevailing government policy of empowering the private sector to take up the major role of production in the economy. It is also true that there has been some growth in incomes of the self-employed but this has been quite slow. Indeed as a percentage of the total taxes on income, it seems to fluctuate. Taxes from employees on payroll amounted to 30.5% of total direct taxes in 1983 but this appear to suffer a general decline albeit with some fluctuations.

Government expenditure

Government expenditures literally refers to all expenses made by and on behalf of government for the administration of the country and providing the economic and social infrastructure which enable the citizenry to go about the daily activities without any difficulty. In this regard government expenditures can be classified in to two main categories; these are recurrent expenditure and capital expenditure. Recurrent expenditure describes all expenditure that relate to running the governmental machinery. In other words it is the outlay that is spent on day to

day running of the government itself, the public and the civil services as well as the security services. This normally includes wages and salaries and all emoluments of all employees in public employment.

Expenditure policies

For a major part of the post independence history of Ghana, government expenditures have always exceeded revenues year by year. Though in some years there were a consistent increase in expenditure in real terms, real expenditures in the immediate post-reform period declined.

Trends in expenditure: 1970 - 83

Generally this period recorded a steady year-by-year increase in public expenditure. However denominated in real terms public expenditure is calculated to have declined by 10% on the average every year (Durdonoo 2000). He illustrates this development using the 1970 and 1983 figures. According to him, in 1970 a real value expenditure of ₵ 1,163.2m slid to a low of ₵391m in 1983.

Recurrent expenditure

Between 1970 and 1983 recurrent expenditures exhibited a pattern that appear to be a fall-out from the economic malaise.

Following the prevailing declining economic fortunes, recurrent expenditure also experienced a systematic and steady decline from about ₵ 904 m in 1970 to about ₵ 246m in 1983 in real terms. Calculated as a percentage of total

government expenditure it was 77% in 1970, rose steeply to 91 % in 1982 but declined slightly to 88% in 1983 .

According to the available records, the single most important component of recurrent expenditure was personal emoluments; that is salaries and wages. It is reckoned that within the period, over 50% of the recurrent expenditures were taken up by this component and principally it is believed that over-staffing was the major cause of this problem.

It is also recognized that the largest chunk of the personal emoluments went into payments for the civil service whilst the state subvented organizations received the second largest component of the recurrent expenditure.

Trends and structure of government expenditure in post ERP Ghana

The behaviour of government expenditure in the post ERP period can easily be seen when one examines the figures closely. For example it is calculated that within the period 1983-90, total government expenditure grew by more than seventeen times with community and social services experiencing the most rapid growth expanding more than 25 times whilst economic services recorded the slowest growth as it registered a 12- fold increase (The State of the Ghanaian Economy 1991). Community and social services have always enjoyed the largest chunk of government expenditure. Trends in the post ERP period shows clearly that it has increased in percentage terms its share of government expenditure. From about 32% in 1983, it shot up to just under 45 % in 1990; expenditure on economic services however appeared to suffer fluctuations. From a 20.9% in

1983, its share of total government expenditure dropped to 15.1% in 1986 but was up again at 18.5% in 1987 before sliding downwards again in the next three years settling at 14.5% in 1990. The trends also show fluctuating share for general services and other purposes whose share of total expenditure was about 18% in 1983 but by 1990 had slumped to 14.4%. Within expenditure on general services which consists of expenditure on (a) general public services (b) defense and (c) public order and safety, the pattern that emerged between 1983 and 1990 is an attempt to divert resources away from public services to meet security needs.

According to ISSER (1998), such shifts in spending have occurred since 1983 and indeed in 1983, 30% of expenditure on general services was taken up by expenditure on security services with defense as the largest shareholder. By 1987, total share of general services in government expenditure had risen to 51%. This however began to fall steadily until it settled at 40.2% in 1990.

Examining the trends regarding security services it is easily discernible that defense spending rose from 16.4% in 1983 to 26% in 1986. All these years its shares were ahead of that on public order and safety but from 1987 onwards, expenditure on public order and safety began to outstrip that on defense. Thus in 1987 when share of expenditure on defense topped 21.0%, that of public order and safety was 30%. From then onward, the share of defense lagged behind.

An evaluation of trends and composition within the community and social services subgroups also reveals a certain pattern that is government diverting resources from educational purposes principally to the health sector. This is

illustrated with the figures below. In 1983, 62.9% of the total expenditure on community and social services was on education while only 13.5% and 13.1 % respectively went to health and social welfare services. By 1990, expenditure on health had shot up to 21% whilst share of expenditure on education had been cut to 53%. It is worthy to note the other components of expenditure on community and social services appear not to have experienced any marked changes with the exception of the social welfare services that enjoyed a marginal increase of 1.9% between 1982 and 1990.

Expenditure on housing and community services also staggered or even fluctuated between 1983 and 1990; it rose from 5.1% in 1983 to 5.9% in 1984 but declined in 1985 to 4.6%, rose again from 1986/87 and dropped again afterwards.

Government capital expenditure

The movement of government development expenditure has also followed a characteristic pattern that has been a feature of the general government expenditure. However the main areas of attention are the increasing interest payment relative to recurrent expenditure and the resulting crowding out effect of recurrent expenditure on governments development expenditure as well as on private sector activities. The analysis of government's total expenditures would be discussed for different sub periods.

1970-83 (pre ERP era): It is estimated that the real development expenditure for the sub period 1970-78 was the highest with the short period 1974-76 being recorded as one period that experienced a tremendous jump.

Within this period development expenditures are calculated to have been in excess of 20 % of GDP .However, the subsequent downturn in the economy severely affected this. As a result, development expenditure dropped in percentage terms and in period 1977 to 1983, this hit a low of 7.28% of real GDP. This is the period that witnessed negative GDP growth rate occasioned by negative growth rates of real investment. The period particularly 1978-83 saw a deterioration in the economic and the social infrastructure resulting in water, electricity and port facilities seriously ran down and roads in grave disrepair. The economy was in sum critically sick and thus needed to be resuscitated.

1984-95: The bold attempt at arresting the decline of the economy started with the ERP initiative. A major component of this programme involved repair and upgrading run-down infrastructure. To realize these objectives, government initiated an improved allocation of operations and maintenance expenditure backed by improved and more efficient planning and implementation of Public Investment Programmes (PIP).

As a result of the commitment towards the implementation of these programmes, the government continued to increase real development expenditure. Thus from a mere 8.4% of real GDP in 1984, it steadily rose to 18.7% in 1995.

The PIP initiative was designed to cover a wide range of activities and in 1993 alone, it is estimated to have accounted for over 96% of total government development outlay.

The scope of the PIP was mainly for the laying and repairing of infrastructure hence 60% of it covered roads, highways and port developments

and rehabilitation whilst 30% was earmarked for the productive and exports sectors that is agriculture, services, cocoa and mining. The rest, 10%, went into social services with particular emphasis on health and education. As a result of the objective of re-shaping infrastructure, the government explored all the various avenues for financing. This is why external loans, grants and other financial assistance came to be the major components of the government development expenditure and therefore created a dependence syndrome. Table 2 below sets out the percentage contribution of external and domestic sources to development budget (1990-95).

Table 2: Contributions of domestic & external sources to development budget (¢ Million or %)

Item	1990	1991	1992	1993	1994	1995
Develop. Exp.	48.300	60.785	98.499	119.254	165.605	208.317
Domestic						
funding	11.5%	14.6%	27.2%	22.1%	28.6%	27.6%
External						
funding	88.5%	85.4%	71.8%	77.9%	71.4%	72.4%

Source: Economic reforms in Ghana: The miracle and the mirage, (2000)

This depicts a deep dependence of development expenditures on donor assistance and for that matter the critical role that donor support plays in government budgets. Indeed as a result of this over dependence on foreign inflows, the debt-GDP ratio and the debt-export ratio have risen to the extent that

Ghana could easily meet the criteria for the severely indebted low-income country (SILIC). Another issue of importance is the external inflows ability to displace domestic resources mobilization as well as increasing the power of the donor community and then their leverage on certain national issues.

Budget balance and domestic debts

Budget balance normally refers to the position of the government's flow of expenditure and revenue. In other words, it is the total central government revenue and grants minus total expenditure.

Thus the way the budget is run has implication for the budget balance. If central government's total expenditure outstrips its revenue, government finds a way to meet the gap created. This is normally described as deficit financing. In the view of Durdonoo (2000) deficit financing does not necessarily lead to the accumulation of debts.

According to Soydan (2001), the main ways of financing deficits are (i) running down its cash reserves (ii) disposing of some its properties and shares in companies and enterprises (iii) Resorting to printing of money and seignorage (iv) borrowing from the commercial banking system and (v) borrowing from abroad. Durdonoo (2000) asserts that since the government of Ghana ran down its reserves and divestiture proceeds were not a source of revenue until the 1990s, printing of money and borrowing from the banking and private sectors have been the major sources of financing the deficits. Indeed it is calculated that printing of

money averaged 3% of GDP whilst government borrowing has also averaged 5% of GDP before 1983 and after 1991.

It is to be noted that public domestic debt profile is determined by how much of the deficit was financed using loans.

Against the background of rising expenditures, raising money to close the gap between revenue and expenditures were inevitable. Government thus had to borrow heavily from both domestic and foreign services leading to an accumulation of both domestic and external debts. The demands of more development imposed further pressures on government to borrow. As a result government finances have become saddled with huge interests and by 1992, interest payments on borrowing had exceeded development expenditure.

A glance through government finances reveals that since 1960 government has achieved surplus in only 6 years that is when budgets are defined in the broad sense and only 2 years in the narrow sense.

Government budget and its influence on domestic debts

Trending of the government budget shows a general widening of the deficits. After 1970, when the budget achieved a surplus, deficits soared to about 13% of real GDP, which amounted to about 47% of total expenditure in 1977. The deficits decreased over the following two years but shot up again in 1980 amounting to about 10% of real GDP or about 58% of total expenditure. The next three years witnessed a surplus on the budget but in 1992 deficit re-emerged as a result of the introduction of a constitutional order. It is computed that the deficits

for 1992 and 1993 averaged 2% of GDP, which situation again was followed by a moderate surplus for the years 1994 and 1995.

From 1996 to date there has been a recurring budget deficit. Between 1996 and 2000, it is estimated that domestic debt grew by an average 31.4% as a result of stagnating government revenue and rapidly rising government spending as well as interest payments on the domestic debts (the state of the Ghanaian Economy, 2002). This is amplified when realizes that in the year 2000 alone, domestic debt interest payments increased by almost 66% and thus exceeded their budget projections by as much as 58.75%.

Domestic debt holdings and sources

An analysis of the stock of domestic debt reveals that financing from the Bank of Ghana (BOG) has been the largest component. The components were mainly from the domestic banking system and the private sector as well as foreign sources.

Between 1971 and 1981 borrowing from the BOG represented the largest chunk of financing the fiscal deficits. It constituted about 2% of GDP within the period and that further boosted money supply.

Indeed, financing fiscal deficits through monetary expansion and borrowing from the bank and public and abroad have always created problems for the Ghanaian economy. Over the years, the main consequences identified to be emanating from these methods of deficit financing are (1) persistent inflation and macroeconomic instability (2) Rapid exchange rate depreciation (3) High interest

rates and widening of spread between lending and deposit rates (4) Crowding –out of the private sector (5) A spiralling increase in domestic debt.

Trends in domestic debt

Ghana's domestic debt grew rapidly in the early part of the 1970s generally but showed a slow but steady decline from 1977 to 1991. In 1991, for example, the domestic debt was estimated at around ₵ 1349.9 million in real terms and this was reckoned to be lowest recorded domestic debt within the post independence history of Ghana. Between 1976 and 1991, the domestic debt in real terms fell from about 35 % to just under 2 % of GDP. However, the situation turned for the worse when between 1992 and 1995, domestic debts in real terms shot up from just over 4 % to a little over 11 % in 1995. This seemed to suggest that the fiscal discipline that characterized the early part of the reform period was lost. A cursory look at the figures shows piling up of domestic debt; In 1983, total domestic debt stood at ₵ 29,319 million but this shot up to ₵ 64,684 million at the end of 1990. An important point to note is that out of these debts, the Bank of Ghana alone had a share of ₵ 16,777.5 million (i.e. 57.2 %) and ₵ 13,691.2 (21.1 %) respectively in the total stock of domestic debts owed by government. This development depicts a shift of government borrowing from the central Bank to the commercial Banks and the private sector. Between 1983 and 1990, it is estimated that non-banking private sector increased its share of government's total domestic debt from around 16 % to 26 % in 1990.

One feature of the debt structure regards how much of the domestic debt is short term in nature and how much is long term. According to Durdonoo (2000) apart from the 1974 and 1992 where short term debts exceeded that of long term debt, the growth of the 1970s to 2000 have been characterized by the dominance of long term debts making up about 70% of total domestic debt.

Another feature of domestic debt is the distribution in terms of holdings. The distribution of holdings has been varied but, there have always been institutions, which have dominated the holdings. Between 1970 and 1973, SSNIT held over 50% of the domestic debt. However, since 1974, the Bank of Ghana has supplanted SSNIT as the largest holder of the domestic debt. In between 1975 and 1986, it is calculated that the share of the BOG in domestic debts holdings was almost the total debt stock whilst it held about 75% and a little under 50% in 1977 and 1988 respectively. The holdings of the BOG and SSNIT seem to be almost equal between 1989 and 1992. But in 1993, the holding of BOG shot up again to around 63% of the total domestic debt with the commercial and secondary and secondary Banks holding approximately equal shares. Between 1996 and 2000, the dominant holding of the BOG seem to decline steadily from a high of about 73% to 39% thereabout in 2000.

Table 3 summarizes the domestic debt holdings by various institutions

Table 3: Domestic debt holdings

Inst.	1996	%	1997	%	1998	%	1999	%	2000	%	2001	%	2002	%
B.O.G	1924.06	73.19	1924.81	55.88	1919.21	42.69	2175.35	37.52	3088.18	39.38	2729.8	29.78	3395.09	24.4
Comm.	74.13	2.82	681.08	19.77	1417.82	31.54	2270.87	39.17	2825.59	36.03	4009.8	39.33	5797.0	41.68
Bank														
SSNIT	54.93	2.09	52.5	1.52	71.5	1.39	71.5	1.23	71.5	0.91	130.5	0.01	624.6	0.04
Other	575.65	21.9	786.2	22.82	1086.97	24.18	1279.55	22.07	1857.06	23.68	3324.6	32.61	4092.0	29.42
Total	2628.76	100	3444.59	100	4495.50	100	5797.28	100	7842.23	100	10194.7		13909.4	-

Source: The state of the Ghanaian economy, (2000 and 2002)

External borrowing

Borrowing from foreign sources to augment domestic resource base to implement government programmes has always been an important element of development funding. Borrowing from these foreign sources have either been in the form of grant or loan facility usually government to government and commercial ones.

In the early 1960s, the government had to look elsewhere outside the country to shore up raised revenues in order to be able to prosecute its development agenda. This method became critical especially against the background of ever worsening terms of trade culminating in dwindling foreign exchange receipts.

Between 1966 and 1972, borrowing from abroad remained an essential element of the fiscal policy of the country. It was only after the 1972 coup when the leadership publicly repudiated Ghana's foreign debts that foreign inflows-both bilateral and multilateral were suspended by the donor community.

Because of the frequent changes in government and leadership through military coups from 1972 to 1978, flows of aid from the aid countries/institutions was reduced and even terminated over the large part of the period.

However, with the return of Ghana to constitutional rule in 1979, aid-both loans and grants began to flow as they used to. An examination of the external accounts of Ghana clearly shows a year by year increase in external debts. In 1981, the total debt stock was \$ 1.714.7 million. This shot up to \$ 1814.4 million around the time the Economic Recovery Programme was launched. This

programme initiated with the help of the Breton Woods Institutions and the donor countries in general opened the gates for a more sustained flow of donor resources and thus contributed to the steady increase in Ghana's total external debt stock. By 1986, the debt stock had climbed to \$ 3486.54. The return of Ghana to constitutionalism imposed further burdens on the national kitty and as a result we have witnessed deep rise in government expenditures. Recourse to external borrowing has thus become an imperative. From the 1992 level of \$ 3968.37, the external debt stock went beyond the \$ 5,000 million mark and by year 2000, it topped \$ 6,039.09.

Tax reforms and revenue in Ghana

In the history of Ghana, the period that has undoubtedly brought profound changes in tax administration has been the period from 1983, when the economic reforms were introduced. The reforms as it connotes had some clear objectives, prominent among of which was the streamlining and pruning of government expenditure and a re-structuring of the revenue institutions into more efficient and vibrant revenue generating systems.

In furtherance of the aim of improving revenue collections, the government set about overhauling the tax system. One of the first acts of government within the period was the simplification of tariff schedules at the rates; 0%, 25% and 30 % and the introduction of new taxes such as wealth (i.e. property and non-commercial vehicles) tax whilst increasing taxes on rental

incomes. Simultaneously government started a programme of improving the tax collection mechanisms.

In June 1984, the government lowered the tax rates in respect of personal incomes but raised the tax rates on a range of consumables especially on cigarettes and beer. In April 1985, these measures were reinforced and the tax increases were extended to cover other special goods and services like airport and casino services and petroleum products for cars. Corporate taxes especially on manufacturing industries were reduced from 55 % to 45 % whilst the 10 % special sales tax on imported goods was abolished. Rather import sales taxes were imposed on milk, rice and processed fish from other countries.

To further enhance tax collection especially in respect of commercial entities, government re-introduced sales tax clearance certification in order to compel a timely payment of sales tax and excise duties collected on behalf of government whilst government took steps to abolish the import licenses in 1989. In the same year, tax thresholds for workers were lowered to allow workers' disposable income to increase. In 1990, government decided to introduce super sales tax ranging from 50 to 500 % on certain luxury goods. To boost activities in the construction sector, government lowered the rate of taxation in the sector from 50 to 45 % with the rate of other sectors falling from 55% to 50 %. Further, the initial capital gains tax was increased whilst a 10% flat vehicle tax was introduced on petrol-driven cars with capacity in excess of 1600cc and diesel cars with capacity in excess of 1800 cc. In addition to these measures, excise taxes were marked down 5 % while government took steps to tighten the tax collection

mechanisms. The 15 % import duty on semi-processed goods was reduced to 10 % and that on cars were set between 5 % and 20 % depending on the car's engine capacity. The special import tax of 40 % on textile imports was reduced to 10 %.

In 1991, the focus of government again drifted largely to reviewing direct taxes. In this direction, the minimum tax exemption level was raised from ₦126,000. It was designed such that incomes above ₦ 3 million per annum were to be taxed at a rate of 25 %. Additional packages included reliefs for marriages, old age, children's education, life insurance and social security contributions. Corporate taxes applicable to agriculture, manufacturing, real estate, construction and services were reduced to 35 %. There was a special package for the export sector in which corporate tax rebates were raised from 60 % to 75 % for agriculture and manufacturing just to serve as an incentive for the exporters. Government decided to tax securities like deposits, debentures, treasury bills and amenities.

In 1992, there were further tax reforms in the service-related industries-commerce, printing and publishing. These led to a reduction in the rate of tax of these concerns from 50 % to 35 %. That of financial institutions was also reduced from 50 % to 45 % whilst withholding tax on dividends was also reduced from 15 % to 10 %. The reforms affected personal incomes as well. Thus, the income tax threshold was raised from ₦ 126,000 to ₦ 150,000. To insulate real industry against unfair foreign competition, a special tax of 10 % was introduced as a protective measure for domestic industry whilst steps were taken to abolish import duties and sales taxes on certain building materials.

The reforms of the tax systems continued to be pursued. Thus in Jan 1993, prices of petroleum products shot up as a result of the introduction of new taxes. However, government moved to reduce corporate taxes from 45 % to 40 %. As a booster to the housing industry, home finance and other mortgage companies that engaged in the provision of homes were exempted from tax obligations. In the same year, government proposed and actually signed a contract for the design of a Value Added Tax (VAT) system to replace the sales and service taxes then in operation.

In 1994, government again shifted its attention to direct taxes and decided to impose between 30 % and 40 % tax rates on the first four income bands and also increase tax rate on commercial vehicles by 100 %. In the course of the year, government removed building materials from the list of duty tax-free items to one with concessionary tax rate of 10 %. In December 1994, the VAT bill was passed to take operational effect in March 1995. January 1995 saw a further tax relief in personal incomes and simplification of import duty rates for various goods and services.

In March 1995, the value Added Tax came into being to replace the existing sales tax at 15.5 % but its implementation never came off as a result of street protests. It was thus withdrawn to allow for the proper education of the populace. The sales tax was reintroduced for the time being. The Value Added Tax thus became a subject of intense education after which it was reintroduced at a much lower rate of 10 %. It was upped to 12.5 % when government decided to charge an additional 2.5 % to set up the GETFUND, the Ghana Educational Trust

Fund to promote education generally and especially help provide infrastructure at the tertiary level. In the year 2001, when the new government took over they introduced new taxes like the national reconciliation levy at 5 % of the net profit of manufacturing companies and financial institutions.

Further, the new government added an additional 2.5 % to the existing VAT for the purpose of setting up a national health insurance cover. It may also be said that from 2001, the tax and other revenue agencies have continued to undergo reforms and modernization to allow for more efficient tax administration and higher revenue for the government to meet its social obligations to the Ghanaian populace.

It is important to put in context the role of the various taxes in facilitating the provision of both economic infrastructure and very vital social services .For example the road levy introduced in the late 1980s has helped in the maintenance of trunk and arterial roads in the country whilst the VAT has been used to channel resources into the education and health sectors, areas which are critical to the economy.

The macroeconomic environment and economic growth

The inconsistent and inappropriate economic policies over the years have created a history of unstable macroeconomic environment in the country.

The general trend movement of the economy especially from the early 1970s to the 1980s showed a severe deterioration in the key macroeconomic indicators. The trade and exchange controls led to a very thriving parallel market

which also further compounded the worsening macro environment. During the greater part of the period, the exchange rate was held at artificially overvalued levels. This created a substantial impetus for the widening of the black market premiums. At the same time, domestic inflation seemed to outpace those in Ghana's major trading partners triggering off real exchange rate appreciation with a debilitating implication for export and imports.

The overall policy stance created favorable conditions for rent-seeking activities/behavior and worked to further undermine the productive base of the economy. Table 4 illustrates the macro environment.

Table 4: Exchange rate, inflation and interest rates (Averages)

Period	Exchange rate	Average inflation	Real lending rate/ interest rate
1970 – 74	1.136	14.00	-6.5
1975 – 79	1.789	74.78	-21.0
1980 – 83	9.563	78.73	-26.7
1984 – 87	89.80	28.63	-7.7
1988 – 91	294.35	28.0	0.5
1992 – 95	810.65	30	13.2
1996 – 2004	5194.4	19.8	36.2

Source: Quarterly digest of statistics and international financial statistics, the state of the Ghanaian economy, (2005)

The rent seeking economic behavior seemed to continue way into post ERP era. However, since the introduction of market determination of exchange rate and to some extent the rationalization and streamlining of the banking system, interest rates have begun to serve their real purpose that is channeling resources into the most appropriate sectors of the economy.

In the period before the ERP, as a result of the economic policies we witnessed a severe repression of the interest rates. Real interest fell below the zero mark. This affected credit allocation to critical sectors of the economy. The effect of this was a contraction of the real side of the economy and a diversion of resources into physical wealth and consumption as well as causing capital flight. It is estimated that between the 1970s and the mid 1980s, Ghana's economy experienced drastic financial shallowing with M2 falling from 26 % of GDP in the mid 1970s to only 13 % in the mid 1980s leading to a contraction of the banking system. The lending rates in the banks were not very realistic and the structure did not sufficiently discriminate between credits with different risks and maturities.

In the midst of the ERP, government pursued financial sector reforms FINSARP vigorously whilst some distressed banks were recapitalized. However, with the reinstatement of democratic governance, another threat to the channeling of resources to the productive sector seemed to emerge. This has resulted from the excessive government expenditure leading to government borrowing from the banking system and the public denying enterprises and the private sector of the needed investments.

The prevailing nominal interest rates in the 1990s were thus very high. In 1993/94, lending rates rose to almost 40 % and by the year 2000, it had moved beyond the 40 % mark though partly due to the severe external shocks Ghana experienced between 1998 and 2000.

On the whole, the macroeconomic environment has gone through periods of crisis and turbulence, but it could be said that the situation after the ERP has generally been better than it was during the period of decline.

External trade

The effect of external trade on economic growth is something that is not in dispute. Indeed, there are various viewpoints regarding this issue. In the 1960s, the dominant view in terms of external trade was inward trade strategy upon which was built Ghana's Import Substitution Industrialization (ISI) policy. Analysis of the policy shows it failed to produce the expected results and in the opinion of some economists that inability of the system to yield dynamic comparative advantage or even develop cheaper products and for them to be able to compete effectively with imports seem to indict the policy. Under this trade regime, quantitative restrictions and exchange controls were frequently used. Direct controls were especially very popular in the late 1970s and these were used as a means of protecting domestic industry. To run this system of controls, import licensing was used to regulate imports.

This elaborate system of government interference with imports just to shore up local industries was only abandoned with the launch of ERP. The

government recognized that with the nature of the Ghanaian economy, a more outward oriented system would be more of an advantage than an inward one.

On the exports front, Ghana seemed to depend on its traditional products – cocoa, timber, gold and bauxite and in the 60s and 70s when prices of Ghana's chief export cocoa fell, it created fiscal problems for the country especially against the background of a rapidly increasing prices for Ghana's imports especially oil.

Indeed in the late 1990s, a more biting external shock affected the stead of Ghana's economy with a severe slump in the prices of all our major exports whilst oil prices and prices of other inputs kept surging up.

A number of attempts have been tried to diversify the exports base of the economy. In fact the five - year plans of the Nkrumah envisaged industrial output for external markets. In 1969, the Progress Party government also introduced an export promotion package meant to encourage manufacturing activities. In 1982, the export promotion again became official policy. This time however, the policy did not just target manufacturing sector but all other products which were described as non-traditional exports by putting in place a range of incentives and a conducive institutional framework.

Generally speaking, the period 1970 – 82 saw a deterioration in the external trade sector. However, the problem was accentuated between 1975 and 1982. The statistics indicate that, import volumes and import to GDP ratio continued to decline after 1974 whilst export/GDP ratio and export volume index also showed a downward movement particularly from 1973.

With open, liberalized and outward regime in place from 1984, the expectation has been that this will facilitate and catalyze the growth process, but this has not been the case as economic growth continues to vacillate around 5 % annually. Table 5 presents a summary of Ghana's trade sector performance 1970 - 2000.

Table 5: External trade performance

Year	Exports	Imports	Trade	Percentage of GDP	
	\$m	\$m	balance	import	export
1970	470.0	280.3	-40.4	19.28	16.94
1973	585.0	372.1	212.9	19.54	12.43
1976	779.0	690.3	88.8	13.73	12.16
1979	1065.7	803.1	262.6	10.38	7.83
1982	607.0	588.7	18.3	1.93	1.87
1985	632.4	668.7	-36.3	10.02	10.60
1988	881.0	993.4	-112.4	16.96	19.12
1991	997.6	1318.7	-321.1	14.25	18.84
1994	1234.7	1579.9	-345.2	22.63	31.80
1997	3152.0	3874.0	-366.0	-	-
2000	7050	8312	-1262	-	-

Source: Quarterly digest of statistics (various issues), IMF, International Financial Statistics Yearbook (various editions)

On the whole, it may be concluded that the external sector which has been at the mercy of political expediency, international trade upheavals and inappropriate policies has not shown its potential to lead growth as expected .

CHAPTER FOUR

METHODOLOGICAL FRAMEWORK

Introduction

This chapter will focus primarily on the methodology to be employed in the study. However before we plunge into that, we will review models that have been applied in similar works. Next an appropriate model for our analysis would be specified. This is followed by setting out the analytical framework which will be used in making inferences. Finally, the data and the sources will be described.

Review of models and the choice of an appropriate analytical framework

The earliest attempts at examining the relationship between fiscal policy or public expenditure and economic growth employed simple production function to determine the sources of growth. Gillis et al (1996) allude to this by saying that at the economy wide level, production functions describe the relationship between the size of a country's labour force and its stock of capital on one hand and the size of the country's gross natural product on the other. In their view production functions measure increases in the value of output or national product given the value of increases in such inputs as the stock of capital and the labour force. Against this background, this approach is argued to provide a consistent framework for relating inputs and outputs.

Based on the principle underlying the production function, some researchers have been able to assess the contribution of other inputs aside of labour and the stock of capital within the framework referred to in the literature as the endogenous growth models. Within this context, researchers have been afforded the opportunity of determining the contributions for instance of specific inputs like public investment, private investment, public and private consumption, inflation, exchange rate or even human capital development etc to economic growth.

This tradition pioneered by Solow (1956) and Denison (1974) have continued to play an important role in growth analysis. In this approach, the production function is defined in a way that capital-output ratio is not fixed but varies and thus allows the analyst to separate out the various causes of growth rather than subsume all these other causes in the capital-output ratio (Gillis et al, 1996). In this method it is also possible to isolate the efficiency parameter that is the contribution made by rises in the productivity with which inputs are used.

This methodology has been enhanced and augmented by the new growth theories which assume the presence of important externalities which can either contribute to or undermine growth. This is emphasized by Ram Rati (1986) and Landau (1983) for example;

Ghali (1998) states that there are three main approaches studying economic growth. These are the single equation system, a simultaneous equation system and finally the Vector auto regression (VAR)/Vector Error Correction (VEC).

According to Bhasin (2004), a single equation may be inadequate to the extent that it may likely yield biased estimates of the parameters especially where there may exist bidirectional causality among the variables of interest and also produce spurious results. On the other hand, a simultaneous equation system though may provide unbiased estimates of the parameters, may not give us the chance to study the impact of shocks on the endogenous variables in the system and the relative importance of each variable in explaining variations in the endogenous variables. In the view of Ghali (1998) both the single and simultaneous equation model can only provide short-run dynamics between the variables and that it is only the VEC/VAR model that can yield information about both the long and short run dynamics of the variables. Judging by the applicability in this study, we opt for the VAR/VEC approach which would allow us to examine both the short and the long run relationships in our system.

Specification of model

We start from the modification of the basic Keynesian output function by

M'Amanja and Morrissey (2005), M'Amanja and Morrissey (2006)

M'Amanja, Morrissey and Lloyd (2005) that

$$\text{GDP} = f(I_p, G^*, X, M) \text{-----}(1)$$

Where I_p , private investment,

X defines exports

M , imports and

G* government activity which they broadly extended to include government expenditure, taxing and borrowing activities;

That is $G^* = f(G, Tt, Gb)$

or $G^* = f(G, Dt, Id, Db, Fb)$ and

Deriving their theoretical basis from Barro (1989) and Kneller et al (1999) that taxation and borrowing activities have a distortionary effect on output/income, M'Amanja and Morrissey (2005) and M'Amanja and Morrissey (2006) have thus expanded the income/output function to

$$GDP = f(Ip, G, Dt, Id, Db, Fb, X, M) \text{ ----- (2)}$$

Where Ip is private investment,

G is the government expenditure,

Dt is direct taxes, Id is indirect taxes,

Db is domestic borrowing, Fb is borrowing from abroad

whilst X and M represent exports and imports respectively.

Since we are interested in the effects of fiscal policy –tax policy, foreign and domestic borrowing on economic growth, we follow the above definition of income/output.

However, since in our model government expenditure becomes endogenously determined in the growth process, a separate function for government expenditure is specified thus;

$$G = f(GR, Fb, Db) \text{ ----- (3) where}$$

GR defines government revenue.

$$\text{But } GR = f(GDP, Tt, Ip,) \text{ -----(4)}$$

From equation 3 government revenue is dependent upon income GDP, taxes Tt and private investment Ip.

Substituting (4) in (3) yields

$$G = f(GDP, Dt, ID, Fb, Db, Ip) \text{-----}(5)$$

From the system, two main equations, (2) and (5) which are the reduced forms are derived. The system thus contains two endogenous variables- GDP and G and seven exogenous variables -Dt, ID, Db, Fb, Ip, X and M.

Where Dt, Id, Fb, Db are the policy variables in the model.

Equations (2) and (5) are converted into growth equations by introducing changes.

Hence (2) becomes

$$\Delta GDP = f(\Delta G, \Delta Ip, \Delta Dt, \Delta ID, \Delta Fb, \Delta Db, \Delta X, \Delta M) \text{-----}(6)$$

Whilst (5) changes to

$$\Delta G = f(\Delta GDP, \Delta Dt, \Delta ID, \Delta Fb, \Delta Db, \Delta Ip) \text{-----}(7)$$

Equations (6) and (7) are reformulated using the distributed autoregressive lag operation in order to obtain a two equation dynamic model applying the assumption by Rao (1994) that a Keynesian system essentially operates on a disequilibrium principle and that a change in any of the variables, particularly the endogenous ones does not result in an instantaneous equilibrium in the system.

Thus,

$$\Delta GDP = f(\Delta GDP_{t-k}, \Delta G_{t-k}, \Delta Ip, \Delta Dt, \Delta ID, \Delta Fb, \Delta Db, \Delta X, \Delta M) \text{-----}(8)$$

$$\text{And } \Delta G = f(\Delta G_{t-k}, \Delta GDP_{t-k}, \Delta Dt, \Delta ID, \Delta Fb, \Delta Db, \Delta Ip,) \text{-----}(9)$$

In this model, a structural dummy D1 is imposed to test the effect of economic policy shift on the endogenous variables.

Our general autoregressive distributed lag model from above is defined in the form of $X_t = A(L)X_t + V_t$ where X_t is a vector of fiscal and non-fiscal endogenous variables and $A(L)$ is an $n \times n$ polynomial matrix in the lag operator such that $LX_t = X_{t-1}$

Identification conditions

In econometrics under the conditions of simultaneity, estimations can be done only when the system satisfies all the identification conditions – that is the rank and order conditions (Gujarati, 1978). However, for a dynamic system as we have formulated there is no necessity in it satisfying the above conditions.

Thus for this model we draw conclusions using our reduced form equations.

Stationarity

In empirical research, one of the problems that come up is spurious relationships. According Soydan (2001), spurious regressions results from situations when certain intermediary variables prevent the actual relationship from being established between the variables of interest.

One of the first key steps used in circumventing spurious estimation is by determining the stationarity status of the variables. According to Thomas (1993) stationarity implies stability in the time path of variables. In other words a series is said to be stationary when it has a spectrum which is finite but non-zero at all frequencies. Such series are normally said to be integrated of order zero denoted moments are not time invariant. In this respect, in macroeconomic research the

most commonly encountered class of non-stationarity – series is what is known as integrated series. Granger (1986) has asserted that the number of times that a variable is differenced in order to transform it into a stationary series determines its order of integration. According to him, a series with no deterministic component and which has a stationary and invertible auto regressive moving average (ARMA) representation after differencing d times but non-stationarity after differencing $d - 1$ times is said to be integrated of order d represented by $X_t \sim I(d)$. To remove the possibility of spurious relationships and making wrong inferences in macroeconomics, the first stage of empirical test is the determination of the order of integration of variables. This is usually referred to as tests for unit roots. The most widely used tests for unit roots are the Augmented Dickey – Fuller (ADF) and Philips Perron tests. The procedure for all these tests involve running a regression of the form

$$\Delta X_t = \alpha_0 + \alpha_1 X_{t-1} + \sum_{i=1}^k \beta_i \Delta X_{t-i} + \mu_t \text{-----(10)}$$

With X_t as a vector of all variables of the model, k , the number of lagged first difference terms needed to make μ_t white noise.

There are two ways of performing the tests for unit root. In the first case, we may assume no trend whilst the second assumes the presence of a trend .

In the test, we test a null hypothesis that X_t has unit roots that is non-stationary against the alternative hypothesis that there are no unit roots in X_t and that the series is stationary.

If however, the series are determined to be non-stationary, stationary can be achieved by differencing. Thus if a series X_t is made stationary by first differencing, then X_t is said to be integrated of order one.

Co integration

The concept of co integration in macroeconomics is predicated on the empirical observation that though variables may move up and down over time, some others move such that they drift in the same direction over time and that once this tendency and behaviour of the group of variables persists over a long period of time, then there may exist some linear relationship between the variables. According to Thomas (1993) the whole idea of co integration assumes that for a given group of variables there exists an equilibrium relationship between them. Put in other words, co integration is the statistical implication of the existence of a long run equilibrium relationship between economic variables.

In conclusion it may generally be said that if there is a dynamic and continuous interaction between economic variables then there must exist a stable long run relationship between the given variables and in the words of Thomas (1993) for every group of co integrated variables there exists a linear combination of the variables which is stationary.

Tests for Co integration – Johansen Approach

The basic test for co integration seeks to determine whether for the variables of interest, there exist a linear combination of the non-stationary series in the regression that yields a white noise or not.

For the system of equations in our model we are unable to apply structural VAR approach because of the problem of identification. In this regard, we will represent the system by the reduced forms of the equations, do the estimation and from the results make structural inferences from the reduced form equations.

Our structural VAR model will be specified as

$$\Psi(L) X_t = U_t, \text{ where } t= 1, 2 \dots n \quad - \quad (11)$$

Where X_t is a $m \times 1$ vector of jointly determined variables whilst the dimension of the $\Psi(L)$ is $m \times m$ and the U_t s are innovations on the X matrix such that they are normally distributed. Finally each of the endogenous variables can thus be expressed as a linear combination of its own innovations and the lagged innovations of the other endogenous variable.

$$\text{Hence } X_t = [\Psi(L)]^{-1} U_t \quad - \quad (12)$$

Following Johansen (1988) and Johansen and Juselius (1990) we adopt the two-step procedure that they formulated.

In this formulation, the standard vector autoregressive VAR model is expressed in the reduced form from the structural form in (11): $X_t = A_1 X_{t-1} + A_2 X_{t-2} + \dots + A_k X_{t-k} + \epsilon_t$

$$t = 1, 2, \dots, k \quad \text{---(13)}$$

Where X_t is a $M \times 1$ vector of macroeconomic variables of interest and α is a matrix of constants and ϵ_t is the error term. Assuming X_t contains integrated series of order are $I(1)$ and K shows the lag length of the series then equation (13) can be re-parameterized into an error correction representation as

$$\Delta X_t = \alpha + \pi X_t + T_1 \Delta X_{t-1} + \dots + T_{k-1} \Delta X_{t-k+1} + \epsilon_t \quad t = 1, 2, \dots, k \text{-----} (14)$$

Where $T_i = -(A_{i+1} \dots + A_k)$ $i = 1, 2, \dots, K-1$

And $\pi = -(I - A_1 - A_2 \dots - A_k)$

In this approach T s are used to represent the matrices of co-efficients of the first difference variables that provide information on the short-run dynamics whilst the co-efficient of matrix π capture the long-run information. The co-efficient of the lagged dependent variable represents inertia and as well provides information on the formation of expectations whilst the co-efficient of the other lagged endogenous variables show the pass-through effect.

Now since ϵ_t is stationary we use the rank $P(\pi)$ to determine how many linear combinations of X_t are stationary; in other words how many co integrating vectors exist in the model. We can thus test for the hypothesis that if r is the rank of π then

$(0 < r < m)$ where m is the full rank

From above three cases can be distinguished.

(A) H_0 : Rank $(\pi) = m = r$

(b) H_0 : Rank $(\pi) = 0 = r$

(c) H_0 : Rank $(\pi) = r < m$

If (a) is accepted, the matrix has full rank implying that X_t is a stationary series.

However if (b) is accepted, the implication is that the π matrix is null and that implies that there is no stationary long-run relationship existing among the variables. Hence the VAR model in (13) is to be used.

On the other hand if (C) is accepted, it means r yields a distinct number of co integrating vectors linking variables in the VAR. In this scenario, the Johansen approach can allow one to explicitly test for the number of co integrating vectors without relying on arbitrary normalization. In case some of the variables turn out to be non-stationary but co integrated, their dynamic relationship will be correctly specified using an error correction representation from the co integration regressions (Bhasin, 2004).

The Error Correction Model (ECM)

Usually to circumvent the problem of spurious regression results researchers apply differencing of non-stationary series. However, Granger and Newbold (1974) have shown that this approach takes away much of the information on the long run characteristics of the data. A way out for researchers is to use the error correction representation of the model to capture both the short and long run relationships between the variables. According to Engle and Granger (1987), if two variables are co integrated then an equilibrium relationship between the variables can be represented by an error-correction model (ECM). Soydan (2001) alludes to the fact that the VECM formulation contains information on both the short and long run properties of the model with disequilibrium as a process of adjustment to the long-run model.

The error correction model can be set up in two ways. The first approach is by using the co-integrating relationships. The second is by directly imposing long run homogeneity thus constructing the ECM without estimated parameters.

Generally, the error correction model can be defined mathematically as

$$\Delta Y_t = \sum \gamma_i \Delta Y_{t-1} + \sum \alpha_i X_{t-1} + \beta ECT_{t-1} + dt \quad \text{----- (15)}$$

Where the series Y_t and X_t are co-integrated variables and ECT_{t-1} is error term lagged one time period obtained from the co-integrating relation whilst dt captures the deviation from the long run steady state relationship among the variables and β , the coefficient of the error term shows how ΔY_t responds to the deviation from the long run equilibrium.

In deriving the ECM the appropriate lag structures of the variables are determined arbitrarily or by applying the tests for lag structures of the variables. By using the simultaneous FIML estimation technique, the general or the over-parameterized model for each of the endogenous variables will be used to arrive at the parsimonious or the most preferred model.

Granger causality/Non-causality

A common phenomenon in macroeconomics is where one variable drives another. Thus in macroeconomic research, it is important to determine whether changes in one variable can result in changes in another. According to M'Amanja et al (2005), because the VAR approach assumes that variables are potentially endogenous, there is a possibility of causality in one direction or other. In the words of Charemza and Deadman (1997), the fact that the VAR system does not

a priori hypothesize direction of causation among variables makes it particularly useful for fiscal variables which are co-determined.

The test used in such situations is generally known as causality/non causality test. There are a number of variants of causality/non causality test. However for our purpose, we would apply the Granger – Sims test for causality. Osoro (1997) asserts that one main objective of causality test is to determine whether a given variable drives another and that there are no other possible influential variables that let it seem that one variable drives the other. Osoro (1997) further outlines the philosophy behind the Granger causality test; that is that a series X_t is said to cause Y_t if Y_t is predicted by a model using the past values of X and Y than by a model using Y alone.

For example, to test whether X drives Y , we first test the null hypothesis that X does not drive Y by running two regressions.

$$Y = \sum_{i=1}^k \alpha Y_{t-i} + \sum_{i=1}^m \beta_i X_{t-i} + E_t \quad \text{-----} \quad (16)$$

$$Y = \sum_{i=1}^m \alpha Y_{t-i} + E_t \quad \text{.....} \quad (17)$$

Using the sum of squared residuals from the regressions we can calculate an F value and determine whether the group of coefficients like $\beta_1, \beta_2, \beta_3$ are significantly different from zero. If that is the case, we reject the null hypothesis that X does not drive Y .

The next stage is to interchange the positions of X and Y so as to determine whether the lagged values of Y are significant from Zero. Now to

conclude definitively that X drives Y, we must reject the hypothesis that X does not drive Y and accept the hypothesis that 'Y does not drive X'.

In conducting the granger causality/non-causality test, researchers normally include the error terms so as to derive more efficient estimates.

Forecast error variance decomposition

Though the Granger non causality test seem to be able to predict the influence of one variable on the other, it is said that the right-hand side may be undermined by the fact that the right-hand side variables are not usually orthogonal (Litterman, 1985). For this reason, researchers sometimes use forecast error variance decomposition as a way of measuring the percentage of the variance of the forecasted variable attributable to alternative right hand side variables at different time periods. The variance decomposition of the VAR thus normally provides information about the relative importance of the random innovations. In order to preserve consistency and because it is believed that variance decomposition is sensitive to the order in which the variables are presented Nd'ungu (1997), we will maintain the order of the endogenous variables in the way they were presented in the co integration tests.

$$\text{Now let } X_t = [\Psi(L)]^{-1} U_t \quad \text{----- (18)}$$

Thus to obtain information about the dynamics of the system, we decompose the contemporaneous covariance matrix into variable specific shocks by orthogonalizing.

We begin by expressing the contemporaneous model as $\epsilon_t = AU_t - (19)$ where $A \sum A' = I$. I is an identity matrix and ϵ_{ts} are innovations derived from the reduced form VAR model.

In sum, the forecast error variable can help identify the most effective instrument for attaining a specific objective for a given target variable.

Impulse response functions

Another important development in macroeconomic research is the application of simulation tools in determining changes in one variable when another variable undergoes a change. Johnston and Di Nardo (1997) have characterized impulse response functions as the chain or knock-on effects from one standard deviation perturbation in each of the other innovations when no other shocks are in the system thereafter.

Put in another way, an impulse response function traces the response of an endogenous variable to a change in one of the innovations. Again it may be used in measuring the response of a given variable to a shock in other variables. Impulse response functions can thus measure both the current and future values of the given endogeneous variable to one standard deviation shock in one of the innovations.

For our system, the endogeneous variables are G and GDP therefore our impulse response functions can be specified below in a matrix form. From equation (7) we can obtain a Choleski decomposition where the matrix A is a triangle of positive elements on the diagonal. Using Choleski's orderings.

We thus define $X_t = \theta(L) \epsilon_t$ -----(20)

$\theta(L) = [[\Psi(L)]^{-1} [A]]^{-1}$ where $\theta(L)$ is of dimension 2×2

Where

$\theta_{11}(L) \quad \theta_{12}(L)$

$\theta_{21}(L) \quad \theta_{22}(L)$

$\theta_{11}(L)$ represents the reaction of growth in government expenditure due to shock in itself.,

$\theta_{12}(L)$ defines the response of growth in government expenditure to a shock in economic growth

$\theta_{21}(L)$ captures the time reaction of economic growth to a shock in growth in government expenditure and lastly

$\theta_{22}(L)$ refers to the time reaction path of economic growth to a shock in economic growth.

Long run equations for the endogenous variables and the expected long run relationships

Following theory, long run relationships are expected among the endogeneous variables in the model. Thus in the long run, we expect the following long run relationship economic growth and the other endogeneous variable.

$$LGDP = f(LG)-----(21)$$

+/-

From the equation, we expect a negative or positive relationship between economic growth and government expenditure.

Government expenditure is deemed to affect economic growth in either of two ways depending on the way the expenditures were applied or utilized. It is frequently argued that when expenditures go into consumption it tends not to create the impetus for economic growth because it does not support private investments. Based on this premise we can predict that in the long run growth in government expenditures would have a negative effect on economic growth.

However there is another school of thought that thinks that government expenditure has a gestation period before it will eventually translate into infrastructure that enhances private enterprise. In other words as far as government expenditure is channeled into economic and social infrastructure which motivates private activities, it is likely to promote growth. Thus in the long run, government expenditure predicted to have a positive effect on economic growth.

From our model the expected long run equation for government expenditure is defined below

$$LG = f(LGDP) \text{ ----- (22)}$$

+

In this formulation, we expect that an increase in economic growth creates an upturn in economic activities and this is likely to create more revenue for spending. Again, increasing economic growth require enhanced infrastructure which could only be provided through increased government investment. Our

conclusion is that in the long run, there will be a positive relationship between government expenditure and economic growth.

Short -run equations and relationships

Since our model involves a dynamic framework, we are also interested in the short run relationships between the endogenous and the exogenous variables. In the words of Scarfe (1977), once the model involves standard endogenous variables and the time derivatives of the exogenous variables, the short run analysis implies determining the time-paths followed by the endogenous variables as they respond to shifts in the exogenous variables.

For our purpose, we have seven endogenous variables in our model and therefore, our short run analysis would basically centre on examining the effects of changes in the exogenous variables on the endogenous variables.

$$\Delta LGDP = f(\Delta LGDP_{t-k}, \Delta LG_{t-k}, \Delta LDT, \Delta LID, \Delta LFB, \Delta LDB, \Delta LIP, \Delta LX, \Delta LM, D1, ECT_{t-1}, \dots) \quad (23)$$

$\begin{matrix} +/- & +/- & - & - & + & - & + & + \\ +/- & + & & & & & +/- & \end{matrix}$

The equation above shows the expected short run relationship between economic growth and the other related variables. From theory, it is postulated that the feedback effect can go in either way depending on the way growth process went in a particular quarter preceding the current period.

Similarly, the lagged effect of government expenditure on economic growth is variable. If the expenditure in a particular quarter is channeled into

investments, then according to theory, the effect is likely to be positive because it provides the conducive framework for private enterprise. On the other hand, if the expenditures went into non productive activities, it is likely to generate a negative effect.

The literature on the effect of taxes on economic growth is emphatic that growths in taxes and tax rates have a distortionary effect on economic growth. We therefore in this light predict that growth in both direct and indirect taxes would have a negative effect on economic growth.

Regarding government borrowing, it is expected that in the short run , there will be a negative relationship between economic growth and domestic borrowing but a positive relationship between economic growth and foreign borrowing .This is because domestic borrowing is usually said to divert resources away from productive activities thereby having a negative riposte on growth but foreign borrowing is argued to enhance economic growth in the short run because these aid /funds are normally monitored and even sometimes come with strict conditions and thus applied in a way that eventually enhance economic growth.

In the literature, there is an overwhelming agreement that private investment activities promote economic growth. This position is enhanced by empirical studies. Based on these, our *a priori* expectation is that there is a positive relationship between economic growth and growth in private investments.

A priori we anticipate a positive effect of growth in exports on economic growth and a variable influence of growth in imports on economic growth.

We also assume that change in economic policy direction signifies an attempt to motivate economic growth thus in our estimation we anticipate a positive response of economic growth to economic policy shifts .

The short run function for government expenditure would be derived from the equation below.

$$\Delta LG = f(\Delta LG_{t-k}, \Delta LGDP_{t-k}, \Delta LDT, \Delta LID, \Delta LFB, \Delta LDB, \Delta LX, \Delta LM, \Delta LIP, D1, ECT_t) \quad (24)$$

+/- +/- + + + + + + +

- +/-

In this formulation, the feedback effects in the various time horizons are anticipated to be variable depending on the prevailing conditions .Similarly the lagged effects of economic growth on growth in government expenditure are expected to be variable. The nature of the effect in such instances is determined by the position of the long run values in relation to the short run ones.

As gathered from the public expenditure literature, in the short run, growth in direct and indirect taxes tend to promote growth in government expenditure. This is underlined by the *Please effect*. *A priori* we apply theory to predict a positive relationship between growth in government expenditure and growth in direct and indirect taxes. We anticipate the same response of government expenditure to growth in domestic borrowing; just following the principle of spending as a result of the availability of resources.

The view of theorists on the effect of growth in foreign borrowing on growth in government expenditure is slightly different. In this case it is usually

argued that whether growth in foreign borrowing would cause an increase in government expenditure or not would be dependent on whether the aid has strict conditions from the granting agency or not or whether or not aid is channeled into specifically defined programmes or projects.

It has been established that an increase in private sector activities enhances government's revenue mobilization and such an increase ultimately leads to increased growth in government expenditure. *A priori* we expect a positive relationship between growth in government expenditure and growth in private investment.

Similarly, we predict a positive effect of growth in exports and imports respectively on growth in government expenditure.

Regarding the effect of the policy dummy on growth in government expenditure we anticipate a negative effect. This is because the economic policy shift on most occasions has the thrust of rationalization and the thinning of government expenditure.

Data sources and description

All the data required for the research were extracted from secondary sources. For the study, data used were mainly in their quarterly forms and span from 1971 to 2004. For the tax variables, the quarterly data for the period before 1986 were unavailable so we relied on interpolation of the annual data using Microsoft Excel.

In particular, most of our reference sources were the International Financial Statistics, Government Finance Statistics and Finance Yearbook which are all publications of the International Monetary Fund.

In addition, the quarterly digest of statistics by the Statistical Service of Ghana, Bank of Ghana publications, The State of the Ghanaian Economy by ISSER(various editions), and CEPA's publications served as useful sources of references.

The tax variables were obtained from the records of the Custom Excise and Preventive Service, the Internal Revenue Service and Value Added Tax Secretariat.

CHAPTER FIVE

ESTIMATION, ANALYSIS AND PRESENTATION OF RESULTS

Introduction

This chapter will report on the estimation and the regression analysis. It will start by examining the unit roots of the log levels and the differences of the variables and their order of integration. Next it will report on the cointegration tests and proceed to discuss the estimated parsimonious VEC models for all the endogenous variables.

Finally, the results of the Granger Causality tests, Forecast Error Variance Decomposition and the Impulse response functions are discussed.

Table 6: Unit root tests of log levels of variables and the order of integration of variables

Sample	Variable	ADF Value	PP Value	Lag Length	Order of Integration
136	LGDP	-1.353988	-1.917881	4	I(1)
"	LG	-0.217503	-0.3703813	4	I(1)
"	LDT	-0.905124	0.194503	4	I(1)
"	LID	-0.278260	-0.725761	4	I(1)
"	LFB	-2.546954	-4.130674	4	I(1)
"	LDB	-2.747533	-3.699343	4	I(1)
"	LX	-0.161302	-0.288882	4	I(1)
"	LM	-0.8622594	-1.021976	4	I(1)
"	LIP	0.046046	-0.022125	4	I(1)

ADF Critical Value at 1% is -3.4811

ADF Critical Value at 5% is -2.8835

PP Critical Value at 1% is -3.4796

PP Critical Value at 5% is -2.8830

Table 7: Order of integration of first differences of variables

Sample Size	Variable	ADF Values	PP Values	Lag Length	Order of Integration
136	DLGDP	-4.985330	-9.655061	4	I(0)
"	DLG	-7.173163	26.59435	4	I(0)
"	DLDT	-6.607697	-19.36380	4	I(0)
"	DLID	-7.737726	-27.56984	4	I(0)
"	DLFB	-7.597108	-14.67696	4	I(0)
"	DLDB	-7.400381	-13.030858	4	I(0)
"	DLX	-6.766300	-17.88668	4	I(0)
"	DLM	-5.534786	-18.72420	4	I(0)
"	DLIP	-6.463730	-15.02433	4	I(0)

ADF Critical Value at 1% is -3.4815

ADF Critical Value at 5% is -2.8837

PP Critical Value at 1% is -3.4800

PP Critical Value at 5% is -2.8830

From the table above, it is quite clear that all the variables are integrated of order 1 in levels and zero in first differences. This thus offers us just the type of variables needed for our cointegrating/VEC system. Accordingly, all the variables will enter the system in their log-first differences.

Plot of series

A cursory examination of the graphs of the log levels of variables shows they are non-stationary. However, the plot of the first differenced variables indicates stationarity in levels. This confirms the stationarity tests. (Refer to appendices C, D, E, F and G).

Results of Cointegration test

A co integration test was carried out to determine whether there exists a linear combination of all the endogenous variables that is stable and stationary. The table below reports the results of the cointegration test.

Table 8: Johanssen Cointegration Tests

Sample: 1971:1 2004:4

No. of observation included: 131

Test assumption: No deterministic trend in data and intercept

Series: LG LGDP

Eigenvalue	Likelihood Ratio	5% Critical	1% Critical	Hypothesized No. of CE(S)
0.150216	28.01064	19.96	24.60	None**
0.049767	6.687356	9.24	12.97	At most 1

*(**) denotes rejection of hypothesis at 5% (1%) significance level.. LR test indicates 1 cointegrating equation at 5% significance level.

Table 9: Unnormalized Cointegrating Coefficients

LG	LGDP	C
-0.047790	0.042827	0.175829
-0.223870	0.244761	-0.659876

Table 10 Normalized Cointegrating equation

LG	LGDP	C
-1.115886	1.0000	4.105553
LOG LIKELIHOOD RATIO 99.86233		

From Tables 8, 9 and 10, the log likelihood ratio test shows that the null hypothesis of at most no cointegrating vector is rejected in favour of one. This means there is only one cointegrating equation that span the simultaneous system. This appear to be inconsistent with theory upon which most writers have predicted two cointegrating vectors; one for economic growth and the other for fiscal relations (M'Amanja, 2005).

Table 9 reports the estimated unnormalized cointegrating coefficients from the multivariate Johanssen tests. We use the first row to generate our error correction series which will enter our VEC model.

Using the unnormalized system we obtain the normalized coefficients in Table 10. The long run equation for economic growth can thus be expressed as

$$LGDP = 1.115886LG - 4.1005553 C \text{-----} (25)$$

From the above we derive our error correction term as

$$E_f = LGDP - 1.115886*LG \text{-----} (26)$$

Long-run relationships

The above equation enables us to establish the long run relationship between economic growth and growth in government expenditure. Our equation shows that in the long term there is a positive relationship between economic growth and growth in government expenditure. This appears to be consistent with the result obtained by M'Amanja et al (2005). In precise terms, a 100% growth in government expenditure precipitates a more than proportionate change in economic growth of about 112%.

Presentation of vector error correction models

In the estimation of the short-run models, all the endogenous variables were entered in their first differences with four lags. Each model was systematically allowed to depend on long run solution using the co integrating vector of error correction terms each lagged one period. Thus the error term for each example in the economic growth equation shows the impact in the other endogenous variables on economic growth when the former deviate from their expected long-run trend. The error correction terms therefore serve the purpose of correcting such equilibria.

In the estimation the coefficient of the error correction term defines what is known in dynamic theory as the speed of adjustment or the quantity of disequilibrium transmitted each period to it for example the economic growth variable arising out of the deviations of the other endogenous variable from their normal trends. Each model was systematically reduced from its general to a

preferred form known as the parsimonious model by applying statistical and economic principles.

Table 11: Fiml estimated parsimonous Vec Model for Economic Growth.

Sample: 1972 (2) To 2004 (4)

Variable	Coefficient	Standard Error	T-Value	T-Prob
DLGDP_1	0.283076	0.098978	2.86	0.005
DLGDP_2	0.137462	0.060556	2.27	0.026
DLG_4	0.277453	0.1067127	2.60	0.011
DLFB	-0.049866	0.0117887	-4.23	0.000
DLDB	-2.260742	0.569456	-3.97	0.000
DLID	0.116025	0.043455	2.67	0.009
DLIP	0.1197661	0.037727	3.20	0.002
DLM	0.074789	0.032517	2.30	0.024
D1	-0.120864	0.0339506	-3.56	0.000
EF_1	-0.015659	0.00623865	-2.51	0.014
Constant	0.091204	0.036776	2.48	0.015

Diagnostics

Vector Portmanteau (12): 48.9379

Vector EGE-AR 1-5 Test: $F(20,214) = 1.0707(0.3824)$

Vector Normality test: $\chi^2(4) = 157.90(0.0000)$

Vector hetero test: $F(69,275) = 0.88464(0.7246)$

Vector hetero- X: $F(267, 78) = 7.6449(0.0000)$

The table above refers to the reduced and preferred model for economic growth. From our results, we observe that the feedback effect subsists for only two quarters that is the first two quarters. In the first quarter, the measured feedback is about 0.28 relative to one unit increase in the lagged value of economic growth. The impact in the second quarter reduces to 0.14.

The effect of the lagged values of growth in government expenditure on economic growth is transitory. Its contemporaneous effect is significantly registered only in the last quarter where a 100% increase in government expenditure results in about 28% increment in economic growth.

From our parsimonious model we notice that the impacts of the all financing sources excepting direct taxes are significantly registered. Of these, the variable with the greatest impact is domestic borrowing. A 100% growth in domestic borrowing triggers about 226% decrease in economic growth. This may probably reflect the fact that this may be exerting a negative impact on private investment activities and thus undermining growth in the economy.

The estimated coefficient for borrowing from abroad is rather negative. This conflicts with the results obtained by M' Amanja et al (2005). What this means that the foreign borrowing does not yield the desired dividends in the short run. This may lend us credence to the fact that borrowing normally goes into recurrent and unproductive spending and consumption.

In the short run the effect of growth in indirect taxes also precipitates a positive response from economic growth. In actual terms a 100% growth in indirect taxes leads to approximately 12% economic growth. The effect of the private investment variable on economic growth confirms our *a priori* expectations that is that the relationship between economic growth and private investment is positive. From our estimated results, a 100% increase in private investment leads to just about 12% economic growth. Though this is in line with the proposition that private investment is the engine that drives economic growth, the proportion of change in economic growth is surprising.

The estimated impact of growth in imports also shows a positive response from economic growth; here the contemporaneous effect is just under 8% economic growth with respect to a 100% increase in imports.

The coefficient for the policy dummy shows a negative sign meaning that economic growth in the short run response negatively to change in economic policy. This runs against our *a priori* expectations and may be due to the fact that it takes time for policy reforms to get effectively instituted and actually bear the expected fruits.

Table 12: Estimated Parsimonious Model for Growth in Government Expenditure

Variable	Coefficient	Standard Error	T-Value	T-Prob
DLGDP_1	1.023675	0.40947	2.50	0.015
DLGDP_4	-1.38206	0.548437	-2.52	0.014
DLG_1	-0.36469	0.102441	-3.56	0.000
DLG_2	-0.239308	0.1058885	-2.26	0.026
DLG_4	0.273761	0.094727	2.89	0.004
DLFB	-0.170468	0.0546372	-3.12	0.002
DLDB	8.70054	2.423549	3.59	0.000
DLID	0.78476	0.3177166	2.47	0.016
DLIP	0.230918	0.1049627	2.20	0.030
DLX	0.393486	0.1249162	3.15	0.001
DLM	-0.713694	0.1633167	-4.37	0.000
D1	-0.38479	0.1557854	-2.47	0.016
EF_1	0.203769	0.0885952	2.30	0.024

Table 12 shows the parsimonious model for the growth in government expenditure. In the model, the lagged effect of economic growth is felt in the first and the last periods. In the first period, economic growth triggers a positive response from growth in government expenditure. A 100% economic growth results in a about 102% increase in government expenditure. The response of growth in government expenditure to economic growth is rather negative. In nominal terms, 100% increase in economic growth draws a whopping 138% decline in growth in government expenditure.

The feedback effect is felt in three quarters – 1st, 2nd and the 4th periods. A 100% economic growth results in about 36% and 24% decline growth in

government expenditure. However in the fourth quarter, a 100% economic growth elicits about 27% upswing in growth in government expenditure.

Of the exogenous variables, all the sources of financing government expenditure except growth in direct taxes have a significant effect on growth in government expenditure. The contemporaneous effect of borrowing from abroad is negative. This appears not to confirm the result obtained by Njeru (2004) whose results showed that foreign loans have no influence on growth in government expenditure. It also runs opposite to the finding by Geda (1996).

In relative terms, a 100% growth in borrowing from abroad draws just about 17% decrease in government expenditure. This may be due to the fact that some of the incoming resources/aid project funds are diverted into government's normal spending channels and thus depresses/dampens government tax collection effort especially direct taxes.

However, the short run effect of growth in domestic borrowing is opposite. In this case, a unit growth in domestic borrowing results in a more than proportionate increase in the growth of government expenditure. The measured impact is about 870% increment. The impact of growth in indirect taxes follows expectation that it exerts a positive impact on the growth in government expenditure.

From the estimated results we also realize that growth in exports, imports and private investments are significant determinants of growth in government expenditure. Of these three, growth in exports exerts the greatest impact; thus a unit increase in exports calls forth about 0.39 unit growth in government

expenditure. One plausible reason why this may be the case is that increased exports results in dual returns .It first enhances the tax yield from export activities and more importantly leads to an increase in foreign exchange returns which ultimately shores up the spending base of the government .Growth in private investments also impacts positively on growth in government expenditure .In actual terms , a unit increase in private investment yields 0.23 units growth in government expenditure .This appear to show a tendency that increase in private investment greatly improves the productive base of the economy ,which in turn support the tax collections both in the sense of direct or indirect taxes. Exports by the result show a tendency to promote growth in government expenditure but growth in imports has an opposite effect on growth in government expenditure.

The effect of the structural dummy draws the correct response from growth in government expenditure. The contemporaneous effect is negative. In actual terms, the structural change causes about 38% drop in growth in government expenditure.

Causality analysis

Table 13 depicts the pairwise multivariate Granger causality tests between each of the endogenous variables and each of the rest of the other variables. From the results, there is no significant causation between growth in government expenditure and economic growth though there is a very weak link from the former to the latter and vice versa. Between growth in indirect taxes and economic growth, there is a flow of causation from indirect taxes albeit slightly (ie about 20% level of significance) but a strong direction of causation from economic growth to growth in indirect taxes .

Table 13 Selected Results of Causality Tests

Number of observations used: 131

Null Hypothesis: X does not cause y

Test	F - Statistic	Probability
DLG→DLGDP	0.55725	0.69411
DLGDP→DLG	0.11257	0.97790
DLDT→DLGDP	0.26216	0.90170
DLGDP→DLDT	0.25395	0.90677
DLID→DLGDP	1.71776	0.15035
DLGDP→DLID	16.9733	1.3E-08
DLDB→DLGDP	0.36641	0.83216
DLGDP→DLDB	3.76749	0.00986
DLFB→DLGDP	0.03701	0.99735
DLGDP→DLFB	0.30969	0.87104
DLIP→DLGDP	2.92093	0.02998
DLGDP→DLIP	1.05223	0.38328
DLX→DLGDP	0.51054	0.72808
DLGDP→DLX	3.03719	0.02647
DLM→DLGDP	0.38367	0.81997
DLGDP→DLM	0.45101	0.77149
DLDT→DLG	0.23682	0.91709
DLG→DLDT	0.43756	0.78126
DLID→DLG	5.90050	0.00022
DLG→DLID	0.13079	0.97089
DLDB→DLG	0.57633	0.68032
DLDB→DLIP	2.89972	0.02286
DLIP→DLDB	0.17064	0.95302
DLG→DLDB	3.78838	0.00612
DLFB→DLG	0.29865	0.87835
DLG→DLFB	2.48317	0.04721
DLIP→DLG	0.12980	0.97129
DLG→DLIP	0.52208	0.71967
DLX→DLG	0.60380	0.66062
DLG→DLX	0.90932	0.46086
DLM→DLG	0.41844	0.79509
DLG→DLM	1.42684	0.24020

Between growth in domestic borrowing and economic growth, the direction of causation strongly shows from economic growth to domestic borrowing at less than 1% level of significance. Results, however, clearly indicate no significant causality in any direction between economic growth and growth in borrowing from abroad. Surprisingly, instead of the expected result, economic growth is shown to cause domestic borrowing but not vice-versa.

Of the remaining variables, the results show a unidirectional causation from growth in private investments to economic growth, economic growth to growth in exports but no significant causation between growth in imports to economic growth and vice-versa. The empirical results also show that growth in domestic borrowing granger causes growth in private investments. This may be interpreted to mean that rising domestic borrowing tends to affect the growth in private investments, which is consistent with theory.

The result obtained for growth in government expenditure is similar to that obtained for economic growth in the sense that most of the causations run from government expenditure to the other variables, the exception being indirect taxes which is to cause growth in government expenditure.

The causality between government expenditure on one hand and each of the domestic and borrowing from abroad follows our expectation. The tests clearly show that growth in government expenditure granger causes growth in either domestic or foreign borrowing.

Results of forecast error variance decomposition

To determine the relative importance of each endogenous variable in accounting for changes in itself and that of the other endogenous variables, we decompose the error variance for each endogenous variable. In doing this, we have been very particular with the ordering of the endogenous variables by maintaining the order used in the co integration tests since it has been shown that variance decomposition is sensitive to the order in which the variables are presented. The variance decomposition have been done using the reduced form VAR model.

Table 14: A Selected variance decomposition of growth in government expenditure (%) over 20 quarters

Period	S.E	DLG	DLGDP
2	0.552939	99.85407	0.145934
4	0.554185	99.8.0014	0.199862
8	0.579820	99.72340	0.276603
12	0.582150	99.71950	0.280502
16	0.582362	99.71922	0.280797
20	0.582381	99.71920	0.280787

From the results of our forecast error variance decomposition, we observe that over the entire time horizon , changes in government expenditure are largely due to own innovations .In each period of the time span under consideration, own innovations accounted for over 99% of changes due it. This means that in our

system, the most important variable that explains the behaviour of growth in government expenditure is itself. In other words innovations due to economic growth are insignificant in explaining growth in government expenditure.

Table 15: Selected forecast error variance decomposition of economic growth, time horizon: twenty quarters

PERIOD	S.ERROR	DLG	DLGDP
2	0.06757	14.17700	85.82300
4	0.068482	14.34209	85.95239
8	0.068791	15.08543	84.91457
12	0.068813	15.13942	84.86058
16	0.068814	15.14368	84.85632
20	0.068814	15.14401	84.85599

In our decomposition analysis above, it is amply obvious that though the greater percentage of the behaviour of economic growth variable can be attributed to itself, innovations in economic growth due to changes in government expenditure represents a substantial portion of the total innovations. In the short term, our results show that innovations due to changes in government expenditure accounts for just about 14% of total innovations to economic growth. In the medium to long term, the influence of innovations due growth in government increases marginally to a little over 15% of total innovations. As indicated in the results, the bulk of total innovations in economic growth emanates from itself. In

the short term , total innovations coming from economic growth itself represents about 86% ; this reduces slightly to a little under 85% in the medium to the long term.

Results of impulse responses of endogenous variables to shocks

Since we are interested in determining the behaviour of each endogenous variable to change in other endogenous variables, we assess the effect of the current and future values of the endogenous variables to shocks in the innovations. The impulse of each endogenous variable to a standard deviation shock in one of the innovations is provided in the table below.

The impulse response functions have been presented in a way as to be consistent with the results of our variance decomposition.

The table below sets out the impulse response functions of growth in government expenditure.

Table 16: Selected impulse responses of growth in government expenditure

PERIOD	DLG	DLGDP
2	-0.304000	-0.0043220
4	0.019628	0.016158
8	-0.001496	-0.000841
12	9.19E-05	3.52E-05
16	-5.24E-06	-1.51E-06
20	2.80-07	5.99E-08

Table 17: Impulse responses of economic growth to innovations over a twenty period time horizon

PERIOD	DLG	DLGDP
2	0.003844	0.011086
4	0.000581	0.001720
8	1.53E-05	2.35E-05
12	5.59E-08	5.12-07
16	3.00E-09	-7.02E-10
20	2.21E-10	3.93E-10

The tables above display the impulse response functions for each of the endogenous variables. The first table shows the impulse responses of growth in government expenditure to shocks in itself and economic growth.

From the table, we observe that shocks to growth in government expenditure transmits intense trepidation in the time path of growth in government expenditure in the short to medium term. The effect of the shocks appear to fizzle /fade out around the tenth quarter. Thus after the tenth period, growth in government expenditure converges to the long run equilibrium values and attains stability in time path.

From the function and graph of the effect of shock in economic growth to growth in government expenditure, it is obvious that shocks initially result in an irregular time path of growth in government expenditure about the long run convergent points. Stability in the time path is achieved after the eighth quarter.

The response function of economic growth to shocks in itself and growth in government expenditure illustrates that innovation to growth in government expenditure traces a time path that converges and achieve stability from above. The result clearly shows stability is attained again after the eighth period.

The reaction of economic growth to shocks in its own innovation appears to follow a pattern similar to the one above, the only difference is that the short run values are greater in the first six quarters .From the response function and graph, we realize that stability and convergence of the short term values the long run equilibrium points is achieved only after the 8th period .In sum, after the eighth period, the effect of the shocks are minimized and subsequently fades out completely.

CHAPTER SIX

CONCLUSIONS, POLICY IMPLICATIONS AND RECOMMENDATIONS

Introduction

In the chapter, we will attempt to summarize all that has been done in the research and outline the salient findings of the research from which we will derive our policy implications and which in turn will be discussed.

Following these, we will turn our attention to some policy recommendations/suggestions which we hope may assist policy designers and implementers in their work.

We will conclude by outlining the limitations of the present study and suggest further areas which could give new dimensions to the current study.

Synopsis and major findings

The research was begun with an introduction and background to the topic which emphasized the key role that is played by fiscal policy in economic growth and development in general and subsequently referred specifically to the Ghanaian context.

Following this was the elucidation of the research problem from which we defined the main objective of study as appraising the dynamic relationship between the financing aspects/channels in fiscal policy and economic growth.

In furtherance of the research objectives, we embarked upon an examination and discussion of fiscal policy regimes and trends in revenues and expenditures over the period of the research. This section finally ended with an assessment of the broad economic policy frameworks operated by the successive governments.

A survey of related literature provided us with an insight into the theories that explain public spending and government behaviour and some conceptual and theoretical issues relating to fiscal policy and growth. From both the theoretical and empirical literature, we derived the basis for our methodical approach, the VEC/VAR method which we discussed in the subsequent sections.

Based on the research topic and objectives, we developed a two equation simultaneous system with two endogenous, seven exogenous variables and one dummy representing economic policy reform and continued by discussing the estimation and analytical procedures.

We began our estimation by assessing the stationarity status of all the variables, our results clearly showed that all variables achieved stationarity when differenced once. A multivariate Johanssen test for co integration among the endogenous variables in the log forms revealed the existence of one co integrating vector for economic growth, against the other endogenous variable in the system.

We used the error correction terms in our FIML estimation to generate the general VEC models for all the endogenous variables and subsequently obtained the parsimonious and preferred short run model for each endogenous variable. Our long run results show that there is a positive relationship between economic growth and growth in government expenditure

From our short run estimates, we find that the speed of adjustment of economic growth to its long run equilibrium value when disturbed by disequilibrium in either product or the money market is about 0.02. Significantly, the results show that government expenditure, indirect taxes, private investment and imports tend to exert a positive effect on economic growth but growth in borrowing from abroad and domestic borrowing impact negatively on economic growth. Again economic growth appears to be significantly affected by policy framework represented by D1. In real terms, the results show a negative short run relationship between economic growth and change in economic policy direction.

The short run function for growth in government expenditure illustrates that the speed of adjustment government expenditure to its long run equilibrium point when disturbed from the product or other markets is about 0.2. This means that the time taken by government expenditure to return to its equilibrium point is larger than that of economic growth. The policy reform dummy conforms to expectation and significantly influence government expenditure.

In the short run, the determinants of growth in government expenditure are economic growth, its own lags, change in borrowing from abroad, growth in domestic borrowing, growth in indirect taxes and change in private investment. It is also clear from our results that growth in each of exports and imports. Growth in government expenditure is shown to be a positive function of growth in domestic borrowing, indirect taxes, private investment and exports but a negative function of growth in borrowing from abroad and imports.

Using the Granger causality tests we observe that the selected results show unidirectional causality in the variables. It is clear that between economic growth and indirect taxes, the direction is from economic growth towards indirect taxes, economic growth also Granger causes domestic borrowing but growth in private investment causes economic growth. For the rest of the variables, the results establish a causation from economic growth to growth in exports, growth in indirect taxes to growth in government expenditure, growth in government expenditure to growth, growth in domestic borrowing to growth in private investments and growth in government expenditure to growth in borrowing from abroad. Significantly the result does not show any strong causation between economic growth and growth in government expenditure.

We applied forecast error variance decomposition as a further aid in our dynamic analysis and the results indicate that throughout the entire twenty quarter forecast period own innovations represents over 99% of the changes to growth in government expenditure whereas changes in government expenditure due to innovation from economic growth makes up less than 1% of the total innovation. For economic growth, in the short term own innovations account for a little less than 86% of the total with the rest owing to innovations emanating from growth in government expenditure. By the last quarter the proportion of changes due to innovations from oneself is less than 84% and that from growth in government expenditure takes up about 15% of the total innovations.

To assess the effect the current and future effects of a shock in any of the endogenous variables on another, we considered the impulse responses of every

endogenous variable to a one standard deviation shock in each of the other variable. From our results, we conclude that the innovation that cause the most intense trepidation in time paths emanate from the endogenous variables themselves. For both economic growth and growth in government expenditure the innovations from the other variables do not produce the effects that own innovations produce though in the case of economic growth, the effect of the shock emanating from changes in government expenditure is more pronounced than the effect of the shock in economic growth on growth in government expenditure.

Conclusions

From our results, we can make certain observations. First, we conclude that disequilibrium in any of the market has riposte on the other markets. Thus disequilibrium in any one market sets automatically into motion an adjustment mechanism which ensures that disequilibrium is re-established in the long run.

Again our results show that economic growth drives indirect taxes, exports and domestic borrowing whilst private investment drives economic growth. We also find that indirect taxes cause government expenditure but growth in government expenditure drives both domestic borrowing and borrowing from abroad whilst growth in domestic borrowing also drives growth in private investments.

From our short run analysis, we observe that structural change as a result economic policy reform conclusively has a significant impact on the endogeneous variables..

Any unanticipated change in any of the endogeneous variables transmits instability into the system and such shocks create a permanent or temporary effect and that domestic borrowing and foreign borrowing have a negative impact on economic growth in the short term. . We also have conclusive evidence that in the short run growth in direct taxes has no significant impact on either growth in government expenditure or economic growth .Significantly, private investments and imports from our results exert a positive effect on economic growth.

Table 18: A summary of results of tests of hypotheses

Hypothesis	Validated/rejected	Remarks
1	validated	direct taxes do not significantly affect both economic growth and government expenditure
2	rejected	Indirect taxes has significant positive effect on both economic growth and government expenditure
3	rejected	domestic borrowing has negative influence over economic growth but positive effect on government expenditure.
4	rejected	economic growth and government expenditure are co integrated.
5	rejected	
6	rejected	private investments cause indirect taxes, domestic borrowing causes private investments
7	rejected	private investments cause economic growth

Policy implications and recommendations

From our analysis, we have adduced evidence of economic growth→ indirect taxes, economic growth→ domestic borrowing, private investment→ economic growth, indirect taxes→ government expenditure, government expenditure →domestic borrowing, government expenditure →borrowing from abroad and domestic borrowing →private investment causality.

We have also seen that indirect taxes, domestic borrowing and borrowing from abroad have significant impact on economic growth. However, the impact of external flows creates a negative effect on both economic growth and growth in government expenditure. This probably tends to confirm the borrow and spend on consumption hypothesis which does not promote growth in the economy. The fact that borrowing from abroad has a negative impact on growth in government expenditure confirms the suspicion that in the developing world, external inflows tend to dampen or slow down the tax effort thus reducing tax yields. This situation in this study shows that the external inflows more likely specifically affects direct tax revenues. What needs to be done is that government prods and strongly support the tax collection institutions to be up and doing at all times and invoke measures which further will enhance their efficiency. The fact that economic growth actually elicits a negative response from external borrowing may mean that it is not applied properly and prudently. There is therefore the need to take a look at what projects these funds are directed into. This is because as borrowing, they are supposed to be paid back later thus they may become a drain rather than a supplement to financing economic growth if not used appropriately.

Government also needs to assess whether borrowing from abroad is worth it in view of the fact that it empirically generates negative growth rates and that may unnecessarily saddle future generations with debts and debt servicing commitments without any useful returns. It is recommended that government focuses on using indirect taxes as a major means of financing economic growth since it generates a positive effect on growth.

Again the empirical results indicate that domestic borrowing causes a decline in economic growth. This means that mopping up of funds by the government to finance its expenditure undermines economic growth and since growth in private investment empirically generates a significant positive response from economic growth, it is recommended that the government allows investment resources to rather flow to the private sector so that it would engender a higher positive returns in terms of growth.

Our results show that the effect of government spending on growth is witnessed only in the last quarter which implies that it takes quite some for the impact of the spending to be felt. This suggests that there may be some institutional rigidities and bottlenecks which need to be removed for the benefits of government spending to be realized more quickly and in a sustainable manner too. The other possibility is that the channeling of government funds tends to favour what has been characterized as unproductive spending rather than productive ones. In relation to this it is important that the government re-examines the composition of its expenditure and structure it to favour spending which would produce growth in the economy. In the impulse response analysis, we

realize that a shock in government expenditure is found to severely affect the trajectory of economic growth in the short to medium term. Government therefore needs to find a way to minimize the effects by streamlining the structures of all the revenue agencies; including non-tax collecting agencies.

Limitations of study

In the study data was required in quarterly forms, however, for the economic growth variable, the quarterly data were derived from the annual aggregates by applying interpolation using Microfit Excel programme because actual quarterly data was unavailable. Similarly for some of tax variables, it was realized that quarterly data for periods before the late 1980s could not be applied so the researcher had to disaggregate the annual data into quarterly forms. The contention of author is that the availability of the actual quarterly data may be more desirable and enhance the applicability of the results in policy making .

Again in view of the fact that real private investment figures are difficult to come by, we opted to use total capital formation by the private sector in our analysis.

Lastly, domestic borrowing by government was used in its aggregate form rather than its disaggregated forms – borrowing from the banking and borrowing from the public which would have been preferred. However, it was practically impossible to come by these so researcher had to settle for the use of the former.

Areas for future research

In the system that we set up, we assumed that the various methods of financing government expenditure are exogenously determined and thus play a limited role in the model. Further, the causality tests carried out suggest that modeling the methods of financing government expenditure as endogenous variables may be desirable because some of the causality results show the direction of causation to be from the endogenous variables in the system to the exogenous ones. Thus future research could therefore be approached by incorporating the methods of financing government expenditure as endogenous rather than exogenous variables in order to be able to assess their full impact – in short and long runs. Again, apart from the financing modes captured in our empirical model, the external reserves could also feature in any future research to extend the applicability of the results.

In addition we considered external inflows only in terms of loans but this can be extended to include grants and project funds. Another thing that could add a different dimension to the research is disaggregating domestic borrowing into borrowing from the public and the banks.

Again in this research, one of the key findings is that growth in external borrowing has a negative effect on economic growth which is surprising. Future efforts need to be directed at examining this into more detail.

Another area which can be explored is examining the impact of specific indirect taxes on government expenditure and economic growth. Future

researchers can also look at the effect of each of the methods of financing government expenditures on the different sectors of the economy.

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APPENDIX A
 OVERPARAMETERIZED FIML GENERAL SOLUTION FOR
 ECONOMIC GROWTH

MOD (1) Estimating the model by FIML (using Data1)

The estimation sample is: 1972 (2) to 2004 (4)

Equation for: DLGDP

	Coefficient	Std.Error	t-value	t-prob
DLGDP_1	0.260623	0.1483	1.76	0.087
DLGDP_2	0.126645	0.115132	1.10	0.273
DLGDP_3	-0.0274192	0.1377	-0.199	0.843
DLGDP_4	-0.0377082	0.2123	-0.178	0.860
DLG_1	-0.00335690	0.04326	-0.0776	0.939
DLG_2	-0.0214417	0.04391	-0.488	0.628
DLG_3	0.00359221	0.03998	0.0899	0.929
DLG_4	0.2567406	0.19012	1.35	0.179
DLFB	-0.0517695	0.01999	-2.59	0.014
DLDB	-2.23613	0.9334	-2.40	0.022
DLID	0.0974760	0.06014	1.62	0.114
DLDT	0.0780668	0.1149	0.679	0.501
DLIP	0.0984168	0.04818	2.04	0.048
DLX	-0.0210589	0.03979	-0.529	0.600
DLM	0.0519973	0.05832	0.892	0.378
D1	-0.143857	0.06144	-2.34	0.025
EF_1	0.0117453	0.009186	1.28	0.204
Constant U	0.0703926	0.06070	1.16	0.254

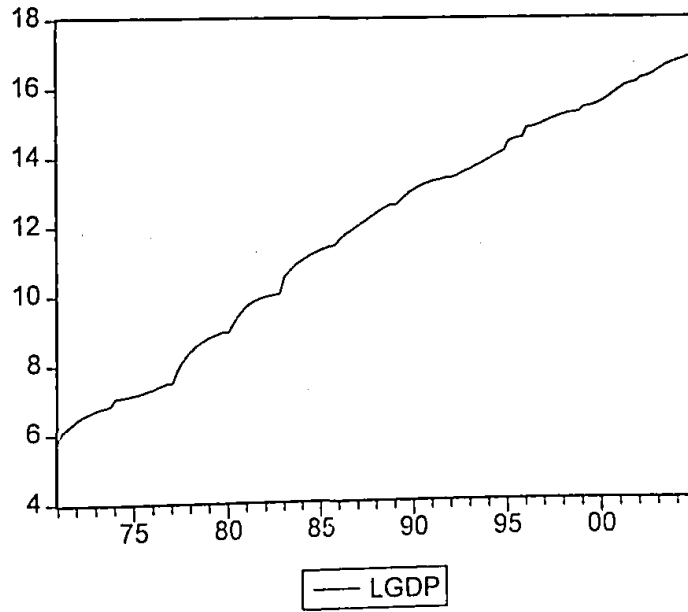
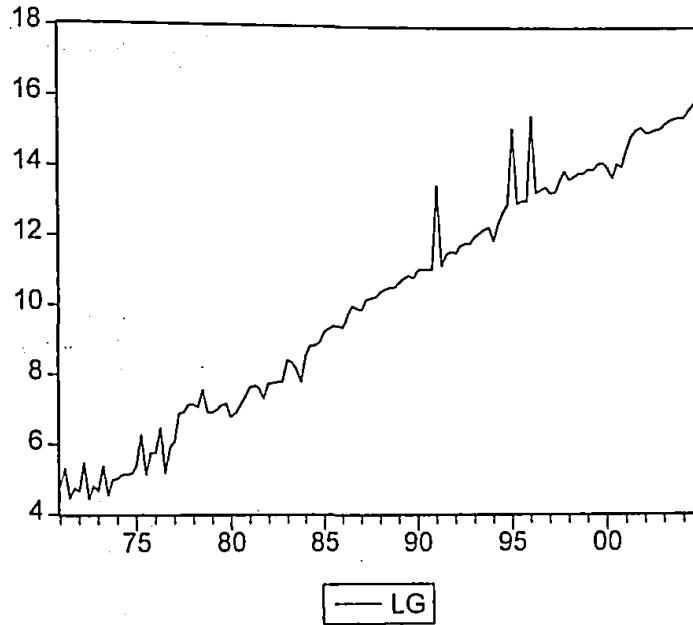
sigma = 0.0742441

APPENDIX B
OVERPARAMETERIZED FIML GENERAL SOLUTION
FOR GROWTH IN GOVERNMENT EXPENDITURE

Equation for: DLG	Coefficient	Std.Error	t-value	t-prob
DLGDP_1	0.988964	0.6120	1.62	0.115
DLGDP_2	0.217156	0.5535	0.392	0.697
DLGDP_3	-0.272504	0.5680	-0.480	0.634
DLGDP_4	-1.42807	0.8760	-1.63	0.112
DLG_1	-0.397435	0.1785	-2.23	0.032
DLG_2	-0.252470	0.1812	-1.39	0.172
DLG_3	-0.155274	0.1650	-0.941	0.353
DLG_4	0.249976	0.1397	1.79	0.082
DLFB	-0.176290	0.08247	-2.14	0.039
DLDB	8.68374	3.851	2.25	0.030
DLID	0.764380	0.4743	1.61	0.116
DLDT	0.0982590	0.2481	0.396	0.694
DLIP	0.205520	0.1988	1.03	0.308
DLX	0.360053	0.1642	2.19	0.035
DLM	-0.710785	0.2406	-2.95	0.005
D1	-0.407334	0.2535	-1.61	0.117
EF_1	0.177838	0.1174	1.51	0.138
Constant U	-0.195068	0.2505	-0.779	0.441

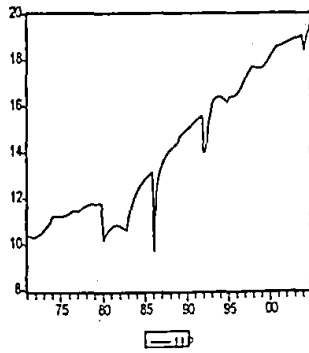
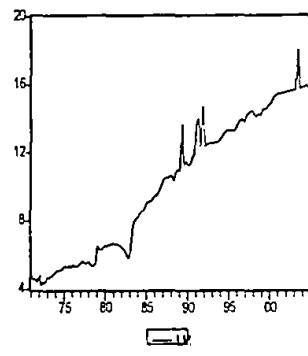
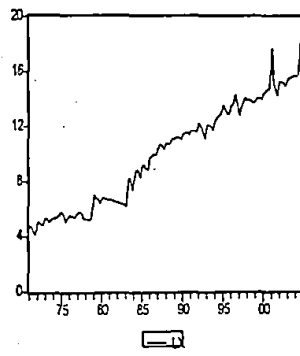
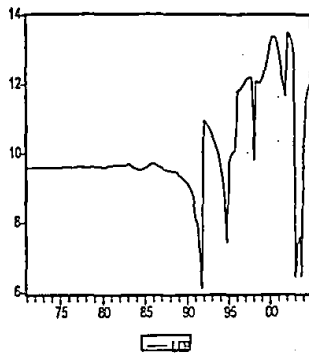
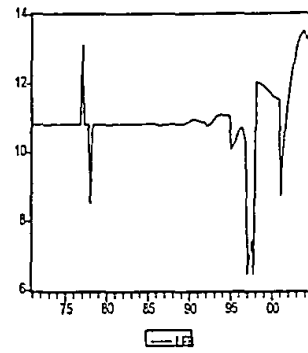
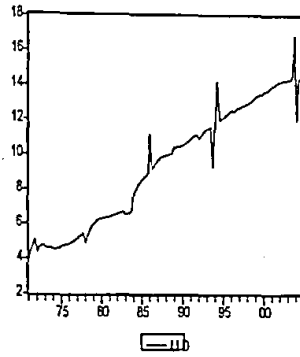
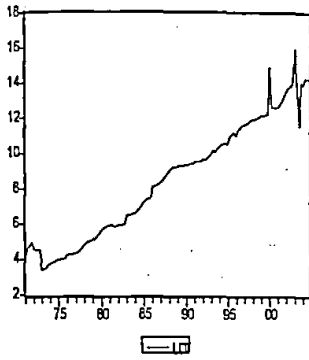
APPENDIX C

GRAPHS OF LOG LEVELS OF ENDOGENOUS VARIABLES



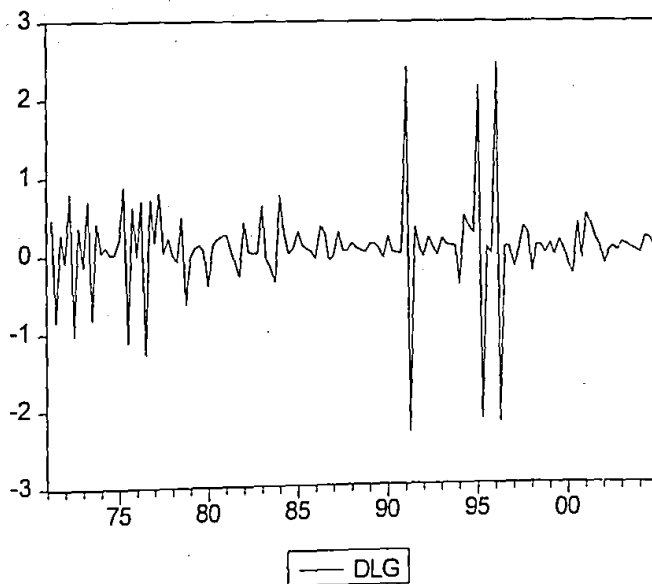
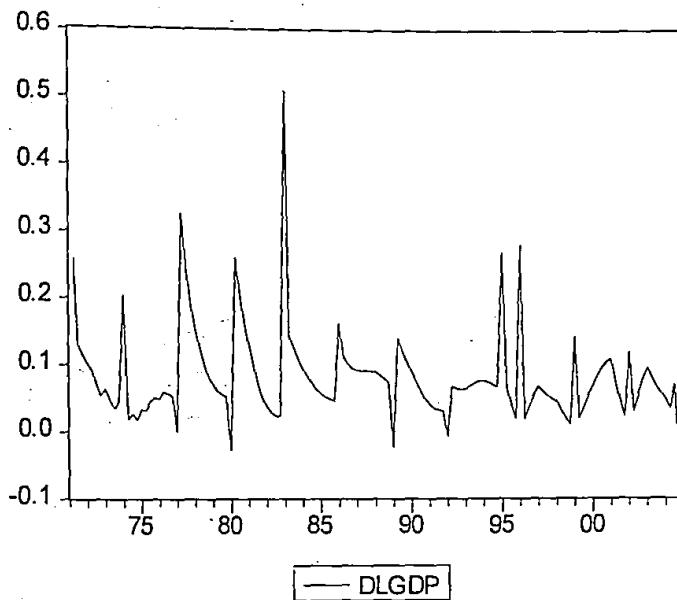
APPENDIX D

GRAPHS OF LOG LEVELS OF EXOGENOUS VARIABLES



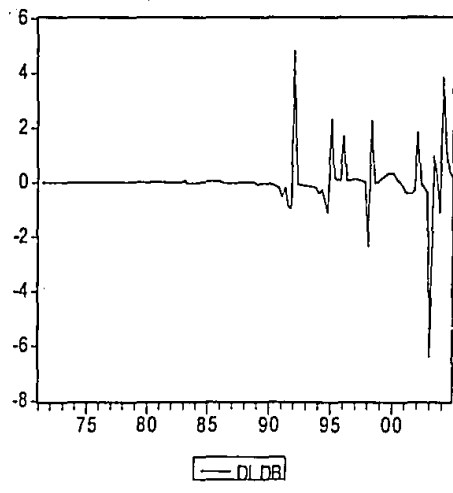
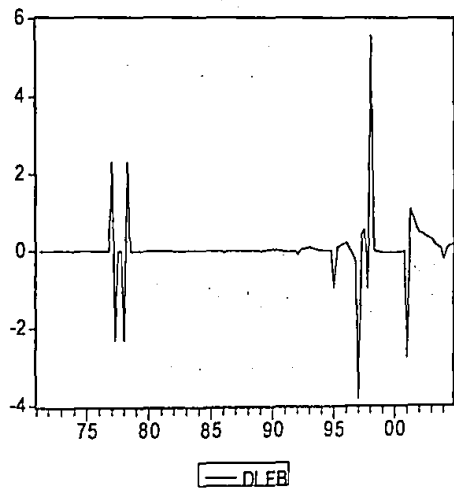
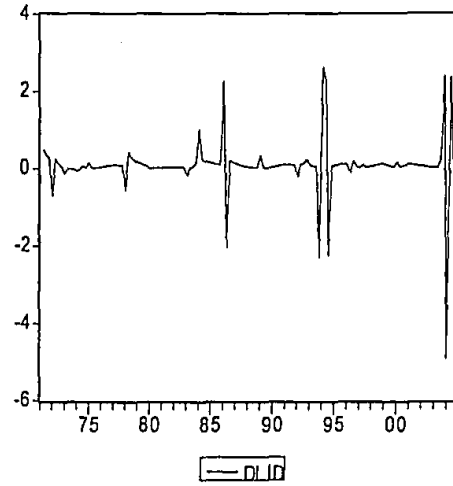
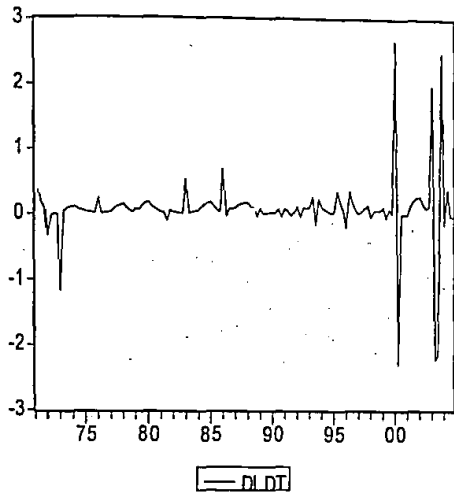
APPENDIX E

GRAPHS OF FIRST DIFFERENCES OF ENDOGENOUS VARIABLES



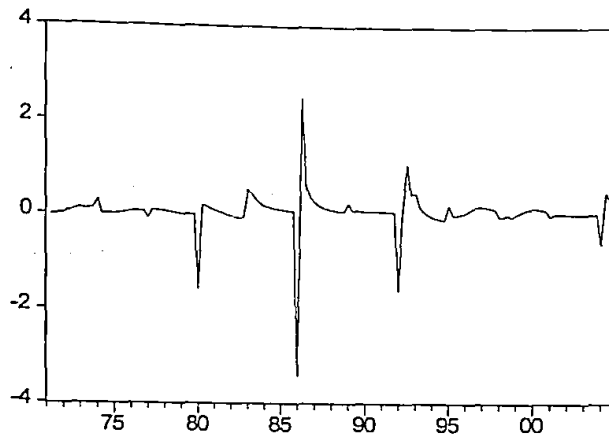
APPENDIX F

GRAPHS OF FIRST DIFFERENCES OF EXOGENOUS VARIABLES

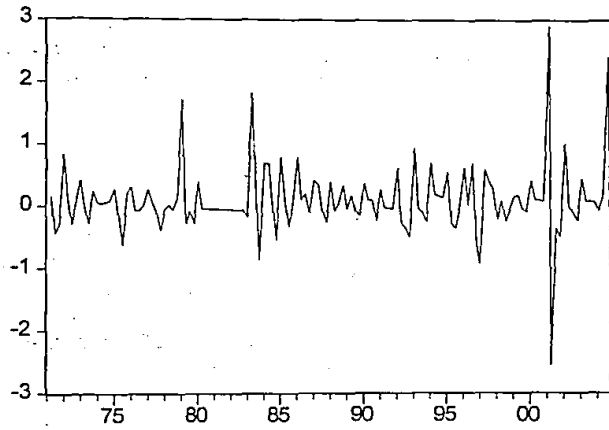


APPENDIX G

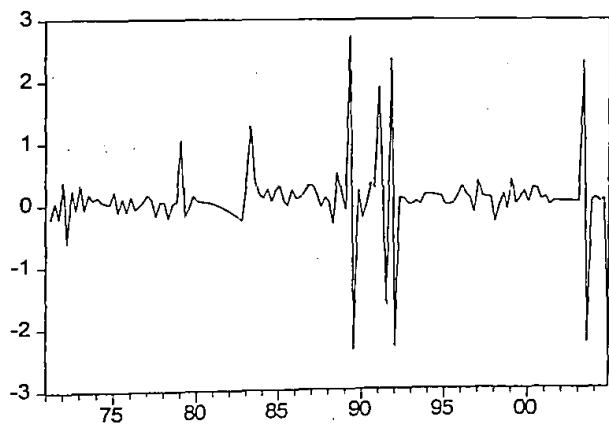
GRAPHS OF FIRST DIFFERENCES OF EXOGENOUS VARIABLES



— DLIP



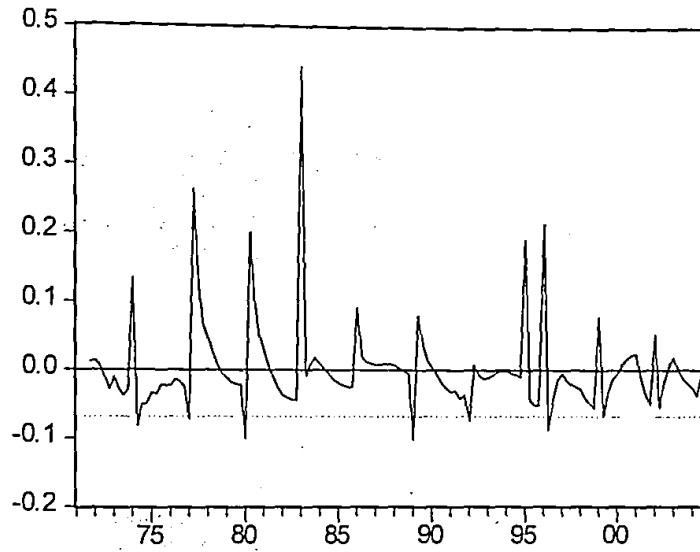
— DLX



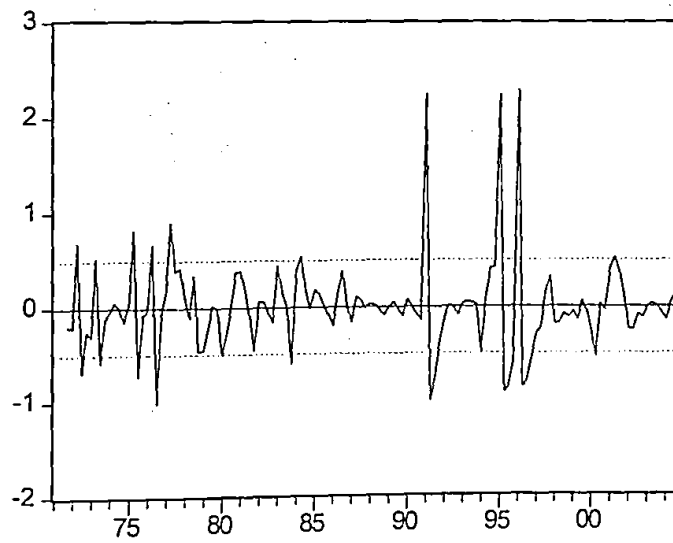
— DLM

APPENDIX H
GRAPHS OF THE RESIDUALS OF THE ENDOGENOUS
VARIABLES

DLGDP Residuals



DLG Residuals



APPENDIX I
 VARIANCE DECOMPOSITION OF THE ENDOGENOUS
 VARIABLES

Variance Decomposition of DLG:

Period	S.E.	DLG	DLGDP
1	0.446040	100.0000	0.000000
2	0.552939	99.85407	0.145934
3	0.553217	99.82186	0.178142
4	0.554185	99.80014	0.199862
5	0.573030	99.72394	0.276062
6	0.579495	99.72815	0.271854
7	0.579504	99.72733	0.272666
8	0.579820	99.72340	0.276603
9	0.581637	99.71961	0.280385
10	0.582086	99.72001	0.279989
11	0.582088	99.71999	0.280010
12	0.582150	99.71950	0.280502
13	0.582321	99.71925	0.280754
14	0.582352	99.71928	0.280724
15	0.582353	99.71928	0.280724
16	0.582362	99.71922	0.280778
17	0.582378	99.71921	0.280793
18	0.582380	99.71921	0.280791
19	0.582380	99.71921	0.280791
20	0.582381	99.71920	0.280797

Variance Decomposition of DLGDP:

Period	S.E.	DLG	DLGDP
1	0.066840	14.52466	85.47534
2	0.067957	14.17700	85.82300
3	0.068307	14.04761	85.95239
4	0.068482	14.34209	85.65791
5	0.068761	15.02158	84.97842
6	0.068767	15.02899	84.97101
7	0.068768	15.03016	84.96984
8	0.068791	15.08543	84.91457
9	0.068810	15.13258	84.86742
10	0.068810	15.13289	84.86711
11	0.068810	15.13290	84.86710
12	0.068813	15.13942	84.86058
13	0.068814	15.14292	84.85708
14	0.068814	15.14293	84.85707
15	0.068814	15.14298	84.85702
16	0.068814	15.14368	84.85632
17	0.068814	15.14393	84.85607
18	0.068814	15.14393	84.85607
19	0.068814	15.14394	84.85606
20	0.068814	15.14401	84.85599
Ordering: DLG DLGDP			

APPENDIX J
 IMPULSE RESPONSE FUNCTIONS OF THE ENDOGENOUS
 VARIABLES

Response of DLG:

Period	DLG	DLGDP
1	0.485323 (0.02976)	0.000000 (0.00000)
2	-0.304000 (0.04474)	-0.004320 (0.04214)
3	0.068701 (0.04650)	-0.036118 (0.04860)
4	0.019628 (0.04418)	0.016158 (0.02116)
5	-0.028736 (0.02622)	-0.005907 (0.00720)
6	0.013317 (0.00945)	-0.000883 (0.00371)
7	-0.002305 (0.00620)	0.001427 (0.00273)
8	-0.001496 (0.00506)	-0.000841 (0.00116)

9	0.001417	0.000170
	(0.00241)	(0.00044)
10	-0.000572	5.85E-05
	(0.00073)	(0.00032)
11	4.97E-05	-7.95E-05
	(0.00055)	(0.00018)
12	9.19E-05	3.52E-05
	(0.00039)	(6.5E-05)
13	-6.88E-05	-5.56E-06
	(0.00016)	(3.2E-05)
14	2.31E-05	-4.38E-06
	(4.8E-05)	(2.3E-05)
15	3.46E-07	3.86E-06
	(4.0E-05)	(1.1E-05)
16	-5.24E-06	-1.51E-06
	(2.5E-05)	(3.5E-06)
17	3.21E-06	9.78E-08
	(8.8E-06)	(2.2E-06)
18	-8.79E-07	2.61E-07
	(3.1E-06)	(1.5E-06)
19	-1.43E-07	-1.86E-07
	(2.7E-06)	(6.0E-07)
20	2.80E-07	5.99E-08
	(1.4E-06)	(2.0E-07)

Response of DLGDP:

Period	DLG	DLGDP
1	0.026738 (0.00558)	0.061471 (0.00377)
2	0.003844 (0.00570)	0.011086 (0.00586)
3	0.002897 (0.00494)	0.005573 (0.00547)
4	0.000581 (0.00269)	0.001720 (0.00217)
5	0.000239 (0.00092)	0.000598 (0.00135)
6	0.000136 (0.00029)	0.000221 (0.00047)
7	9.21E-06 (0.00027)	7.58E-05 (0.00024)
8	1.53E-05 (0.00012)	2.35E-05 (9.3E-05)
9	6.12E-06 (3.9E-05)	1.05E-05 (3.3E-05)
10	-9.89E-07 (1.7E-05)	2.84E-06 (1.8E-05)
11	1.45E-06 (1.1E-05)	1.01E-06 (5.4E-06)

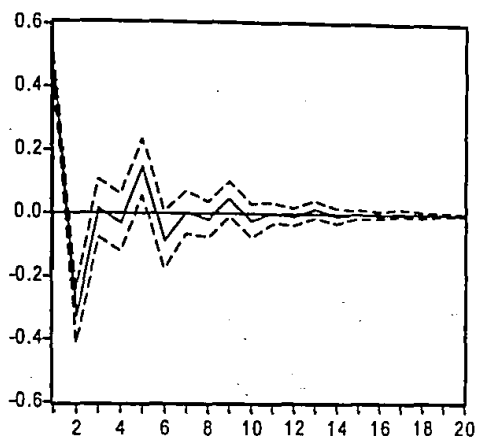
12	5.59E-08	5.12E-07
	(5.9E-06)	(2.0E-06)
13	-8.70E-08	7.37E-08
	(1.5E-06)	(1.2E-06)
14	1.34E-07	5.72E-08
	(7.9E-07)	(3.6E-07)
15	-3.33E-08	2.29E-08
	(6.2E-07)	(1.7E-07)
16	3.00E-09	-7.02E-10
	(2.5E-07)	(7.1E-08)
17	9.20E-09	4.56E-09
	(7.0E-08)	(3.1E-08)
18	-5.07E-09	4.59E-10
	(4.6E-08)	(1.9E-08)
19	1.66E-09	-1.71E-10
	(2.9E-08)	(4.8E-09)
20	2.21E-10	3.93E-10
	(1.2E-08)	(2.3E-09)

APPENDIX K

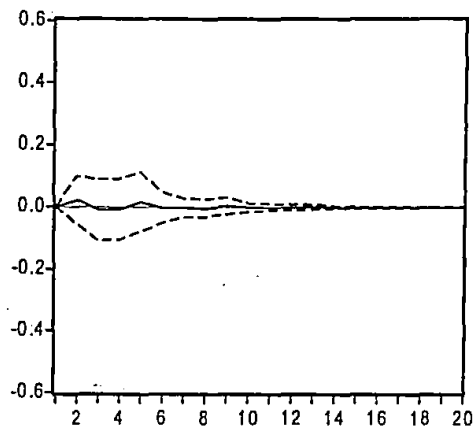
IMPULSE RESPONSES OF ENDOGENOUS TO EACH OTHER

Response to One S.D. Innovations ± 2 S.E.

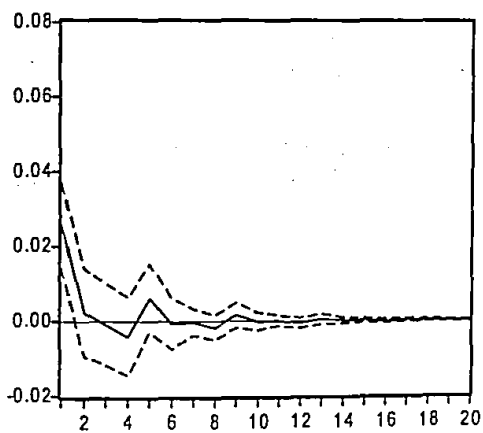
Response of DLG to DLG



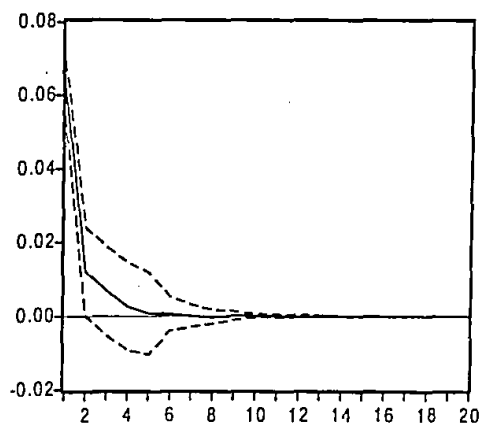
Response of DLG to DLGDP



Response of DLGDP to DLG



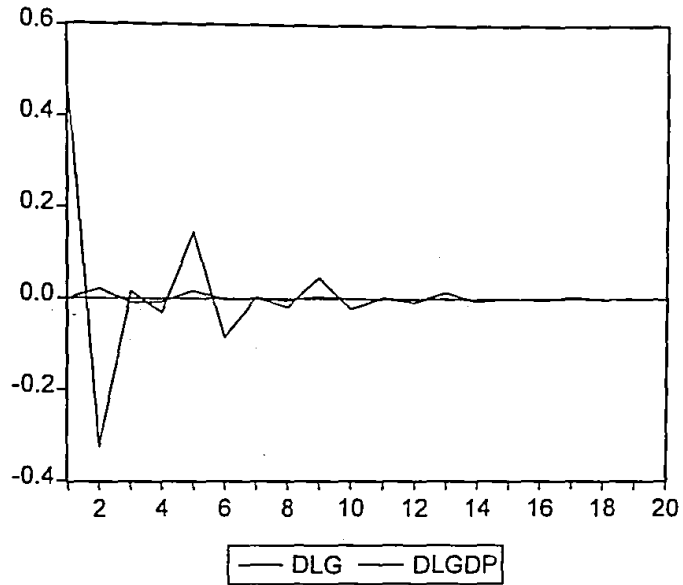
Response of DLGDP to DLGDP



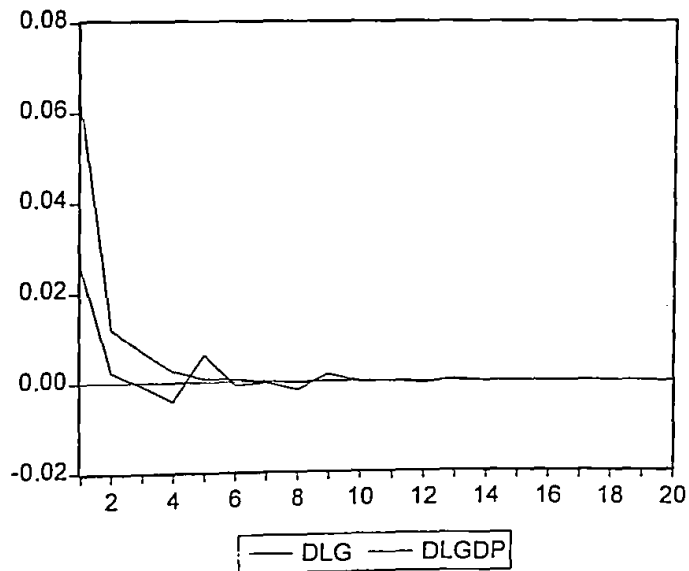
APPENDIX L

COMBINED IMPULSE RESPONSE

Response of DLG to One S.D. Innovations



Response of DLGDP to One S.D. Innovations



APPENDIX M
LOGS OF ALL VARIABLES

LG	LGDP	LDT	LID	LFB	LDB	LX	L M	LIP
4.822698	5.828946	4.320816	3.960813	10.81984	9.616845	4.640537	4.779123	10.40426
5.296315	6.086775	4.680278	4.448516	10.81984	9.617877	4.808682	4.565285	10.37345
4.454347	6.214608	4.863681	4.792479	10.81984	9.618881	4.373742	4.610556	10.34174
4.735321	6.327937	4.944495	5.053056	10.81984	9.619798	4.099498	4.408182	10.34174
4.649187	6.429719	4.612146	4.359270	10.81984	9.620550	4.942214	4.795791	10.34174
5.459160	6.522093	4.582925	4.599152	10.81985	9.621015	5.086608	4.194039	10.40426
4.432007	6.593045	4.583947	4.722064	10.81987	9.621142	4.798184	4.441238	10.46310
4.795791	6.646391	4.573680	4.763028	10.81989	9.620929	4.850388	4.374246	10.54534
4.654912	6.709304	3.404525	4.641502	10.81992	9.620434	5.283863	4.707637	10.66896
5.363168	6.756932	3.440418	4.630838	10.81994	9.619769	5.287913	4.632007	10.75790
4.545420	6.791221	3.514526	4.619073	10.81995	9.619019	5.006493	4.815755	10.85900
4.971894	6.835185	3.613617	4.603168	10.81996	9.618240	5.243597	4.901341	10.96820
5.021905	7.038784	3.732896	4.536891	10.81969	9.612339	5.307079	5.038964	11.25156
5.126936	7.056175	3.826465	4.511958	10.81970	9.617316	5.347393	5.096507	11.23849
5.138853	7.081709	3.891820	4.561218	10.81971	9.622159	5.409098	5.131731	11.23849
5.161065	7.098376	3.951244	4.583947	10.81974	9.626656	5.496143	5.146855	11.23849
5.372032	7.130899	3.988984	4.725616	10.81977	9.630487	5.770506	5.376111	11.23849
6.252289	7.162397	4.019980	4.743191	10.81979	9.633233	5.645093	5.261394	11.25156
5.127529	7.207860	4.039536	4.763028	10.81980	9.634688	5.027165	5.376111	11.27720
5.752255	7.258412	4.048301	4.789157	10.81980	9.634857	5.233245	5.268270	11.32660
5.745564	7.306531	4.289089	4.827513	10.81979	9.633955	5.545177	5.408382	11.37366
6.451260	7.365180	4.295924	4.884316	10.81978	9.632449	5.477300	5.342908	11.42954
5.177843	7.420579	4.310799	4.960745	10.81977	9.630538	5.408964	5.331800	11.48247
5.900445	7.473069	4.333361	5.051137	10.81977	9.628557	5.416100	5.397257	11.53273
6.074426	7.473069	4.361824	5.149817	13.12237	9.651310	5.689684	5.570632	11.44035
6.885919	7.799753	4.437934	5.248076	10.81980	9.648384	5.766444	5.657739	11.52288
6.918003	8.045588	4.549657	5.341377	10.81980	9.645535	5.684260	5.481056	11.59910
7.133854	8.237479	4.684351	5.427590	10.81980	9.642935	5.280153	5.527443	11.66993
7.145811	8.393895	4.837868	4.876723	8.517367	9.640841	5.232712	5.580107	11.71994
7.065332	8.519191	4.938065	5.290789	10.81978	9.639601	5.256245	5.365696	11.76757
7.553523	8.621553	4.999911	5.580484	10.81974	9.639390	5.197391	5.380220	11.79056

6.928753	8.702843	5.029784	5.799396	10.81969	9.640207	5.330300	5.449277	11.80560
6.898543	8.773385	5.116196	5.969219	10.81962	9.641880	7.054450	6.515749	11.80560
6.986141	8.833463	5.184589	6.100095	10.81957	9.644062	6.773080	6.338241	11.80560
7.119118	8.888757	5.309257	6.200712	10.81953	9.646495	6.698268	6.293604	11.79810
7.175834	8.941153	5.471009	6.278146	10.81952	9.649007	6.421622	6.443336	11.79056
6.779251	8.913281	5.652489	6.288416	10.82114	9.617382	6.818880	6.511225	10.20359
6.902290	9.172639	5.778890	6.319509	10.82118	9.633359	6.781398	6.566222	10.40426
7.110549	9.380083	5.865618	6.350187	10.82124	9.648779	6.742480	6.615503	10.57132
7.358977	9.544667	5.921310	6.381478	10.82135	9.663063	6.702059	6.654256	10.69194
7.616170	9.675331	5.951163	6.414278	10.82149	9.675367	6.660088	6.675546	10.77896
7.684591	9.776222	5.972791	6.449522	10.82159	9.684585	6.616574	6.669701	10.83958
7.601727	9.850614	5.865618	6.489509	10.82166	9.690215	6.571415	6.629363	10.87805
7.321182	9.903488	5.921310	6.532625	10.82171	9.692317	6.524472	6.554119	10.85900
7.735757	9.941265	5.951163	6.577444	10.82171	9.691498	6.475556	6.437736	10.83958
7.770265	9.970211	5.972791	6.622470	10.82172	9.688924	6.424318	6.282360	10.77896
7.792630	9.994242	5.986954	6.666575	10.82172	9.685461	6.370415	6.083861	10.71442
7.803627	10.01682	5.993961	6.709060	10.82173	9.681692	6.313476	5.829681	10.64542
8.427872	10.52568	6.519295	6.535967	10.82407	9.741741	6.142037	6.248043	11.18442
8.347391	10.66989	6.533498	6.553221	10.82429	9.698036	7.971776	7.535297	11.62625
8.163927	10.79569	6.561172	6.605569	10.82473	9.653808	8.225235	7.969704	11.93819
7.806749	10.90577	6.601230	6.741937	10.82538	9.612150	7.367077	8.148446	12.17561
8.572751	11.00260	6.652347	7.751905	10.82625	9.578257	8.066208	8.264621	12.36308
8.842984	11.08690	6.758559	8.003162	10.82762	9.559493	8.764990	8.518592	12.52453
8.849139	11.16038	6.904149	8.211537	10.82950	9.559973	8.803274	8.567506	12.66350
8.924639	11.22484	7.072931	8.390268	10.83187	9.579671	8.272315	8.800867	12.78549
9.217207	11.28225	7.252054	8.546616	10.83473	9.614427	9.071883	9.109414	12.89672
9.327658	11.33464	7.368087	8.684147	10.83688	9.656864	9.201098	9.163877	12.99453
9.395051	11.38373	7.438560	8.806095	10.83830	9.701794	8.886271	9.144628	13.08362
9.427116	11.43009	7.471989	8.915083	10.83902	9.746135	8.901911	9.382275	13.16734
9.370602	11.59238	8.162858	11.16578	10.78679	9.756110	9.700330	9.477080	9.740969
9.730223	11.70511	8.133323	9.136102	10.78860	9.718995	9.808792	9.592059	12.22588
9.994169	11.80746	8.219407	9.348022	10.79221	9.680976	10.01521	9.788469	12.87390
9.913689	11.90287	8.298714	9.517715	10.79759	9.643097	9.908823	10.10025	13.26038
9.885494	11.99480	8.395410	9.653910	10.80473	9.607139	10.32872	10.40717	13.53315
10.17314	12.08616	8.532850	9.760546	10.81122	9.575712	10.67672	10.55198	13.73971
10.22174	12.17819	8.695356	9.842304	10.81708	9.550500	10.62925	10.50676	13.90169
10.26838	12.26952	8.870003	9.904137	10.82232	9.532005	10.37396	10.62413	14.03465
10.40642	12.35922	9.047751	9.951468	10.82696	9.519376	10.77516	10.65453	14.14697
10.47896	12.44426	9.162987	9.990326	10.83041	9.510344	10.70704	10.33475	14.24469
10.52456	12.52416	9.266305	10.02467	10.83271	9.503120	10.75441	10.84408	14.33252
10.54660	12.59855	9.233041	10.05689	10.83386	9.496479	11.10318	11.02203	14.41270

10.66951	12.57553	9.320835	10.39225	10.81763	9.392529	11.06387	10.93436	14.66181
10.80277	12.71602	9.326860	10.41880	10.82831	9.347676	11.25166	13.67098	14.76755
10.88260	12.83814	9.338795	10.44692	10.84934	9.298964	11.18252	11.29802	14.86388
10.81933	12.94431	9.356447	10.48080	10.88007	9.242205	11.03634	11.51886	14.95398
11.03993	13.03532	9.379501	10.52622	10.91963	9.170137	11.41061	11.29568	15.04134
11.06007	13.11110	9.408675	10.58940	10.94140	9.070676	11.51855	11.30305	15.12816
11.06871	13.17300	9.483211	10.67071	10.94651	8.930269	11.62668	11.64757	15.21546
11.07358	13.22310	9.443442	10.76578	10.93520	8.730398	11.40884	11.90790	15.30233
13.48145	13.26426	9.527338	10.86753	10.90691	8.196307	11.68296	13.81788	15.38745
11.15724	13.30002	9.579902	10.96794	10.88516	7.990218	11.67074	14.01474	15.46858
11.49668	13.33271	9.555673	11.06285	10.87039	7.105688	11.64360	12.36923	15.54504
11.57397	13.36376	9.590098	11.15064	10.86292	6.146329	11.61061	14.73250	15.61656
11.53227	13.35728	9.699540	10.93566	10.75885	10.97690	12.23714	12.39407	14.02171
11.74552	13.42581	9.663897	11.05733	10.78429	10.88812	11.97680	12.49122	14.11487
11.82666	13.49089	9.767227	11.16768	10.83331	10.79044	11.63229	12.58260	15.21694
11.80425	13.55470	9.860878	11.39017	10.90260	10.68139	11.14423	12.58794	15.66742
11.99669	13.61979	9.973480	11.47761	10.98811	10.55716	12.07955	12.57465	16.13387
12.10421	13.68881	10.23818	11.53866	11.04499	10.41183	12.06659	12.61815	16.30880
12.20245	13.76222	10.08907	11.57732	11.07762	10.23676	11.97580	12.60715	16.39936
12.29272	13.83880	10.32106	9.294131	11.08824	10.01824	11.73553	12.75494	16.42551
11.87939	13.91624	10.43484	11.91519	11.07757	9.594500	12.43871	12.91254	16.40237
12.36746	13.99162	10.51240	14.24101	11.06948	9.321412	12.64024	13.06345	16.34754
12.71046	14.06334	10.56097	11.98943	11.06406	8.608284	12.81694	13.20097	16.27262
12.97231	14.13077	10.58439	12.05854	11.06133	7.477604	12.96964	13.32373	16.18538
15.13497	14.39968	10.61567	12.14383	10.09155	9.797401	13.52434	13.30672	16.40957
12.96881	14.46685	10.97530	12.24144	10.16533	9.969058	13.26401	13.28658	16.41931
13.04870	14.50786	11.15876	12.34746	10.29831	10.06904	12.91949	13.29230	16.43626
13.02517	14.52777	11.23924	12.45860	10.46956	10.11552	12.92984	13.42414	16.47395
15.49268	14.80950	11.04063	12.57225	10.66006	11.81445	13.55924	13.71187	16.54981
13.28020	14.82896	11.40025	12.45860	10.69803	11.85093	13.59532	13.86090	16.67868
13.36447	14.86682	11.58372	12.64974	10.60099	11.92012	14.30433	13.95960	16.85176
13.44269	14.92103	11.66420	12.69825	10.32015	12.01569	13.72601	13.81262	17.04742
13.26507	14.98901	11.68054	12.72165	6.476972	12.13037	12.80482	14.17463	17.24377
13.30307	15.04993	11.73812	12.82229	6.907755	12.19646	13.40594	14.29319	17.42410
13.64759	15.10472	11.84419	12.85435	7.444249	12.22259	13.80694	14.40091	17.58373
13.90792	15.15414	11.98479	12.90059	6.461468	12.21181	14.09933	14.49867	17.72336
13.65772	15.19888	11.94351	12.95909	12.02624	9.860439	13.89432	14.18983	17.70236
13.75363	15.23115	12.00895	13.03828	12.01291	12.12456	13.99449	14.13759	17.68417
13.84594	15.25212	12.07482	13.13338	11.98570	12.09817	13.76737	14.28863	17.70236
13.84190	15.26243	12.14078	13.23973	11.94344	12.08471	13.73322	14.18431	17.67255
13.96789	15.40473	12.25319	13.35324	11.88417	12.19005	13.89556	14.56740	17.70441

13.93888	15.42455	12.20655	13.43065	11.82321	12.37100	14.08470	14.55888	17.78217
14.11198	15.46301	12.28312	13.47912	11.76048	12.65698	14.06146	14.64842	17.90382
14.15555	15.51809	12.29775	13.50250	11.69588	12.97403	13.98778	14.85331	18.05497
14.00033	15.58710	14.97316	13.65276	11.62930	13.28327	14.42064	14.86808	18.21627
13.71864	15.67184	12.66867	13.68449	11.57629	13.40087	14.54380	15.12573	18.37047
14.11356	15.76825	12.67439	13.74509	11.53932	13.38641	14.65188	15.35603	18.51067
14.03502	15.87266	12.68008	13.82960	11.52031	13.23352	14.74895	15.41126	18.63556
14.54115	15.98195	12.68762	13.93221	8.740645	12.85748	17.65245	15.51826	18.61733
14.90077	16.05672	12.83342	14.02126	9.804836	12.43834	15.08955	15.48710	18.66254
15.08423	16.10364	13.06837	14.09931	10.64208	12.01202	14.74504	15.52212	18.70590
15.16471	16.12630	13.33956	14.16825	11.25761	11.70304	14.25698	15.55588	18.74777
15.01250	16.24586	13.61369	14.22948	11.73562	13.52384	15.26985	15.58831	18.78855
15.02641	16.27544	13.77907	14.27306	12.17498	13.44064	15.27140	15.61930	18.82870
15.10119	16.33209	13.87584	14.30110	12.55767	13.25008	15.17747	15.64867	18.86840
15.12169	16.41147	14.00710	14.31483	12.88945	12.87187	14.95601	15.67640	18.90765
15.25801	16.50837	15.98762	14.32574	13.17953	6.473891	15.41265	15.70259	18.94627
15.35707	16.58971	13.76397	14.32843	13.35251	7.420579	15.51552	18.03006	18.98394
15.41805	16.65841	11.60440	14.51190	13.45316	7.615791	15.61234	15.75139	19.02048
15.44720	16.71653	14.08921	16.89497	13.49998	6.480045	15.70170	15.79686	19.05582
15.43634	16.76558	13.94378	11.97597	13.27653	10.31327	15.64565	15.88407	18.44738
15.64698	16.80086	14.33097	14.31570	13.34558	11.52593	15.81276	15.90683	18.93544
15.83045	16.87191	14.30781	14.39734	13.47084	11.91010	18.22227	15.97870	19.27995
15.91093	16.83493	14.28979	14.50853	13.63347	12.05809	16.02381	13.81624	19.54029

APPENDIX N

GRANGER CAUSALITY/ NON CAUSALITY TESTS

Pairwise Granger Causality Tests

Date: 10/16/06 Time: 13:20

Sample: 1971:1 2004:4

Lags: 4

Null Hypothesis:	Obs	F-Statistic	Probability
DLG does not Granger Cause DLGDP	131	0.55725	0.69411
DLGDP does not Granger Cause DLG		0.11257	0.97790
DLDT does not Granger Cause DLGDP	131	0.26216	0.90170
DLGDP does not Granger Cause DLDT		0.25395	0.90677
DLID does not Granger Cause DLGDP	131	1.71776	0.15035
DLGDP does not Granger Cause DLID		16.9733	1.3E-08
DLDB does not Granger Cause DLGDP	131	0.36641	0.83216
DLGDP does not Granger Cause DLDB		3.76749	0.00986
DLFB does not Granger Cause DLGDP	131	0.03701	0.99735
DLGDP does not Granger Cause DLFB		0.30969	0.87104
DLIP does not Granger Cause DLGDP	131	2.9209	0.02998
DLGDP does not Granger Cause DLIP		1.05223	0.38328
DLX does not Granger Cause DLGDP	131	0.51054	0.72808
DLGDP does not Granger Cause DLX		3.03719	0.02647

DLM does not Granger Cause DLGDP	131	0.38367	0.81997
DLGDP does not Granger Cause DLM		0.45101	0.77149
DLDT does not Granger Cause DLG	131	0.23682	0.91709
DLG does not Granger Cause DLDT		0.43756	0.78126
DLID does not Granger Cause DLG	131	5.90050	0.00022
DLG does not Granger Cause DLID		0.13079	0.97089
DLDB does not Granger Cause DLG	131	0.57633	0.68032
DLG does not Granger Cause DLDB		3.78838	0.00612
DLFB does not Granger Cause DLG	131	0.29865	0.87835
DLG does not Granger Cause DLFB		2.48317	0.04721
DLIP does not Granger Cause DLG	131	0.12980	0.97129
DLG does not Granger Cause DLIP		0.52208	0.71967
DLX does not Granger Cause DLG	131	0.60380	0.66062
DLG does not Granger Cause DLX		0.90932	0.46086
DLM does not Granger Cause DLG	131	0.41844	0.79509
DLG does not Granger Cause DLM		1.58706	0.18200
DLID does not Granger Cause DLDT	131	2.57760	0.04976
DLDT does not Granger Cause DLID		5.46494	0.00044
DLDB does not Granger Cause DLDT	131	6.48331	9.2E-05
DLDT does not Granger Cause DLDB		1.18953	0.31885

DLFB does not Granger Cause DLDT	131	0.03316	0.99786
DLDT does not Granger Cause DLFB		1.18755	0.31971
DLIP does not Granger Cause DLDT	131	0.02149	0.99909
DLDT does not Granger Cause DLIP		0.68179	0.60587
DLX does not Granger Cause DLDT	131	0.39209	0.81398
DLDT does not Granger Cause DLX		0.40446	0.80514
DLM does not Granger Cause DLDT	131	1.28583	0.27930
DLDT does not Granger Cause DLM		3.31651	0.01287
DLDB does not Granger Cause DLID	131	5.11006	0.00077
DLID does not Granger Cause DLDB		1.28785	0.27852
DLFB does not Granger Cause DLID	131	2.76842	0.03826
DLID does not Granger Cause DLFB		0.21944	0.92716
DLIP does not Granger Cause DLID	131	2.92077	0.022382
DLID does not Granger Cause DLIP		0.04766	0.99567
DLX does not Granger Cause DLID	131	0.35865	0.83759
DLID does not Granger Cause DLX		3.84206	0.00563
DLM does not Granger Cause DLID	131	4.17308	0.00334
DLID does not Granger Cause DLM		1.71703	0.15051
DLFB does not Granger Cause DLDB	131	0.81882	0.51555
DLDB does not Granger Cause DLFB		0.79601	0.52999

DLIP does not Granger Cause DLDB	131	0.17064	0.95302
DLDB does not Granger Cause DLIP		2.89972	0.02286
DLX does not Granger Cause DLDB	131	1.54714	0.19283
DLDB does not Granger Cause DLX		1.37441	0.24675
DLM does not Granger Cause DLDB	131	2.92727	0.02368
DLDB does not Granger Cause DLM		3.78477	0.00616
DLIP does not Granger Cause DLFB	131	0.00888	0.99984
DLFB does not Granger Cause DLIP		0.11513	0.97696
DLX does not Granger Cause DLFB	131	2.21680	0.07107
DLFB does not Granger Cause DLX		0.37595	0.82544
DLM does not Granger Cause DLFB	131	0.07812	0.98885
DLFB does not Granger Cause DLM		0.06390	0.99239
DLX does not Granger Cause DLIP	131	4.66170	0.00305
DLIP does not Granger Cause DLX		0.60107	0.66257
DLM does not Granger Cause DLIP	131	3.50835	0.01396
DLIP does not Granger Cause DLM		0.52018	0.72105
DLM does not Granger Cause DLX	131	2.91963	0.03109
DLX does not Granger Cause DLM		0.31530	0.86729