FISCAL POLICY COORDINATION: ISSUES WITH ILLUSTRATION FROM NIGERIA

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ABSTRACT

This paper has reviewed relevant issues regarding the concepts and operational modalities for fiscal policy coordination in a non-union country setting with a Federal system of governance. It supports the analysis with illustrations from Nigeria's experience. The paper is largely normative or qualitative, providing only a prima facie evidence of coordination or lack of it or ineffective one, in the absence of a more rigorous application of a quantitative dynamic model anchored on the game strategic theory which, however, is more relevant to monetary union setting. It argues that regardless of whether policy coordination should be among the decision makers from its fiscal authorities across the Federation - the focus of this paper – or across the states in a monetary union setting or between decision makers in the areas of monetary and fiscal policy within a Federation, policy coordination should be undertaken at two levels: First, addressing the constraints /issues regarding the operational procedures of policy and second, dealing with the issues of macroeconomic effects that would arise from lack of coordination. Analysis of Nigeria's experience with fiscal coordination indicates that coordination in the country involves a restricted agenda being limited to revenue generation and sharing among the tiers of government and guidelines on external and domestic borrowing by Federal and State government, without consideration for expenditure harmonization since sub-national jurisdictions in Nigeria are autonomous in their expenditure decisions. As reflected in the monotonic rise in the trend of budget deficits and debt levels of sub-national jurisdictions in the sample period 2000 – 2008, fiscal policy coordination in Nigeria is weak and ineffective despite the impressive array of institutional arrangements and instruments put in place for the purpose.

1.0   INTRODUCTION

Fiscal policy is an instrument of demand management, for manipulating or influencing the level and composition of government expenditures and taxation in the economy. In addition it can affect the supply side of the economy by providing incentives to work and invest. The main measures of fiscal policy are taxation and government expenditure including debt-service which is linked together in terms of the government's overall fiscal or budget balance. The

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overall fiscal balance is a widely used indicator to assess the government's net financing need – or accumulation of net financial assets – and its fiscal vulnerability. Thus the importance of fiscal policy cannot be over exaggerated. Changes in government spending and taxation will have immediate effects on aggregate demand. Fiscal policy may also be used in a discriminatory manner to alter the allocation of resource both geographically and industrially. In sum, fiscal policy is used to achieve the desired objectives of allocation, redistribution, stabilization and economic growth. It is a useful tool employed in the pursuit of social and political objectives. Stabilization is the short-run objective that is most commonly associated with fiscal policy in all economies, especially in developed countries. In developing countries, however, growth consideration often seems to be the overriding objective.

1.1   NEED FOR COORDINATION OF POLICY

The objective of macroeconomic policy is to achieve sustainable economic growth in the context of price stability and viable external accounts. In this regard, it is absolutely necessary to foster a close degree of coordination among decision makers in the areas of monetary and fiscal policies. However, considering the experience of fiscal dominance in developing countries including those of West Africa, coordination among decision makers in fiscal policy at Federal, State and Local government levels in a federation – the main thrust of this paper – needs to be seriously addressed. The effective implementation of fiscal policy thus requires extensive coordination between the fiscal authorities in those jurisdictions. Policy coordination ensures the commitment of decision makers to mutually agreed objectives. Such commitment is imperative for obvious reasons:

- to prevent further build up of unsustainable debt;
- to ensure macroeconomic stability enhanced through mutually supportive information sharing and structural policies;
- to sustain financial market deepening by ensuring, among other things, that governments adhere to fiscal prudence;
- to ensure compliance with the country's rules and laws governing fiscal policy, notably spending and borrowing;
- in Nigeria's case, to ensure compliance with the five principal instruments of coordination including the Constitution of the Federal Republic of Nigeria, DMO Act (2003), Fiscal Responsibility Act (2007), State Government Fiscal Responsibility Laws, Investments and Securities Act 2007 and the National Debt Management Framework.

Regardless of whether policy coordination should be among the decision makers from the fiscal authorities across the Federation or across the states in a monetary union setting or between decision makers in the areas of monetary and fiscal policy within a Federation, policy coordination should be undertaken at two levels: First,

addressing the constraints regarding the operational procedures of policy; and second, dealing with long-term macroeconomic effects that would arise from lack of coordination. Coordination, under any level, should not be difficult if all policymakers embraced the common goal – macroeconomic stability. In practice, however, coordination involves haggling and negotiating, and / or takes the form of some policy rules, but nevertheless these may be arrived at within the parameter of a common goal.

1.2   THREATS TO FISCAL POLICY COORDINATION

The economies in the sub-region depend mainly on exogenous sources of revenue be it oil or primary commodities such as cocoa, rubber, etc. Under this scenario, fiscal policy coordination becomes difficult. Such economies are prone to severe external shocks which could render the entire fiscal policy unimplementable, let alone coordinated (Ajakaiye, 2008, p.207). If the tax base and/or rate are determined outside the economy, then fiscal policy programmes are vulnerable to external shocks thus rendering fiscal policy coordination unworkable. For example, in the Nigerian case, when oil prices decline remarkably, revenues accruing from oil decrease thus posing a serious challenge for government's fiscal operations at all levels.   This is particularly the case when the sub-national Governments (SNGs) in Nigeria are heavily dependent on the centre for resources whose source is not only exogenous but volatile. Another element of fiscal policy coordination centres on the impact of business cycles across SNGs in a country.

A downturn in an economy may not affect all the states equally but a severely affected lower level of government would run budget deficits which may affect macroeconomic stability. In such a situation, the affected lower level of government demur at pursuing counter-cyclical fiscal policy since the incidence of the business cycle is unevenly distributed.

In a multi-party federal system, different political parties with different ideologies may govern the different levels of government. These parties may have different preferences concerning how best to manage the economy. The result would be uncoordinated fiscal policy. For example, in Nigeria some states such as Lagos are governed by the opposition party with different ideology and preferences that may not be in tandem with those of the ruling party that controls the centre. This type of situation would create problems for fiscal policy coordination. In a federal system, the correspondence problem, that is, a mismatch between assigned statutory expenditures without appropriate revenue anchors would affect fiscal coordination. If the lower levels of government incur large deficits, then fiscal coordination would become a challenge for the government at the centre. In addition, if the assignment of expenditure is not clear, then there could be duplication and waste resulting in weak fiscal coordination.

Indeed pundits would contend that the lack of incentive for SNGs not to borrow can make fiscal policy coordination difficult.   (Ajakaiye, 2008) "If there are no constitutional limitations preventing SNGs from borrowing, if the banks are not discouraged from lending to SNGs, if the capital market is unable to impose discipline on the borrowing of SNGs and /or if the central government is likely to intervene with a bailout, then there will be incentives to borrow thus complicating macroeconomic stability" (Ibid, p. 208). In the Nigerian Federal System, States are not allowed to borrow externally without approval from the government at the centre. However, they are allowed to borrow from the capital market subject to the approval from the states' Houses of Assembly. Some states' have floated bonds but the impact on their economies and whether such borrowings affected fiscal policy coordination is an empirical matter.

Another factor impinging on fiscal policy coordination is endemic corruption and massive looting of the treasury at all levels of government. In countries where corruption permeates both the public and private sectors, the efficiency of fiscal policy coordination for macroeconomic stability will remain a tall order, considering that the injections of money balances would be larger than the real goods and services provided resulting in higher prices and unemployment.

This paper seeks to examine the concept of fiscal policy coordination among the decision makers from the fiscal authorities across the federation, with illustration from Nigeria. Nigeria operates a federal structure of government and has the largest economy in the West African sub-region. Some states in the Federal Republic of Nigeria are larger than some countries in the sub-region. In Nigeria, states and local governments have assigned statutory expenditure functions and if her fiscal policy is not coordinated within, then distortions would occur in the fiscal policy of not just Nigeria but in the sub-region. However, the paper is largely normative or qualitative, providing only a prima facie evidence of coordination or lack of it or ineffective one. The treatment of the normative or/ methodological issues has been lacking in most works on fiscal coordination in extant literature. This paper seeks to fill the gap.

Even so, it recognizes that a much more rigorous approach to analysis of coordination is being canvassed especially in the decision of coordination arrangements among EMU countries. The approach involves the application of quantitative, dynamic model based on the game strategic theory and this is increasingly becoming fashionable between the member countries. In a non union country with a Federal System where levels of government are autonomous especially with regard to spending decisions, it is, however, extremely problematic to apply the game theory to fiscal policy coordination.

For purposes of easy exposition, the paper is divided into six parts. Part 1 is this introduction. Part 2 focuses on a review of the literature. Part 3 dwells on theoretical issues while Part 4 articulates the effects of coordination. Part 5 reviews Nigeria's case study and proffers suggestions for the way forward, while Part 6 contains the conclusion of the paper.

The paper draws heavily on the work of Frankel, Goldstein and Masson (1990) of the International Monetary Fund (IMF) and on the background IMF Working Paper on Financing Budget deficits prepared by Beaugrand, Loke and MLachila (2002). The paper by Dome Nico Raguseu and Jan SEBO (2011), on Fiscal Policy Coordination in EMU was also helpful.

2.0   REVIEW OF LITERATURE

The issues of policy coordination between one country and other countries in a monetary union dominate the literature on the design of macroeconomic policies in the European Monetary Union (EMU). Studies, however, concerned with policy coordination among fiscal authorities within a country are few and far between.

Tabellini (1986) analyses the coordination between a single monetary authority and several independent fiscal authorities in the context of a game model. He finds that policy coordination between the fiscal authorities and the common monetary authority increases the speed of convergence toward the common steady state as compared with the outcome of the non-cooperative game.

In their dynamic model, Turnovsky, Basar and d' Orey (1988) compare Wash, Stacklberg and Pareto solutions and find that the advantages from full-fledged cooperation are likely to be relevant.

Nordnaus (1994) considers the strategic relationship between one fiscal and one monetary authority. When a Nash game is played with the Central Bank, the lack of cooperation among fiscal authorities is responsible for an inefficient policy mix, resulting in an excessively expansionary fiscal policy. The solution of Stackel berg game (with the fiscal authority players as hegemonic leader) taking the Central Bank's monetary reaction into account) dominates the Nash outcome. This result is explained by the difference in the objectives of the two authorities.

The fiscal authority seeks to fight unemployment by means of an expansionary policy but the Central Bank reacts with a restrictive monetary policy to keep inflation under control. The outcome in a too expansionary fiscal policy in the Nash equilibrium and the secondary effect is a crowding out effect of private investments

in favour of public expenditures. When the fiscal authority takes such behaviour into account, and it plays the role of a Stackelberg leader, it will act in a less expansionary way so as to allow the Central Bank to follow a less contractionary policy. (Reguseu and Sebo (2011)

Focusing their attention on the interaction between monetary and fiscal policies in a monetary union, Beetsma and Bovenberg (1998) find that a monetary union with decentralised fiscal policy could result in excessive spending and inflationary bias. The finding suggests that fiscal coordination or fiscal centralization may exert discipline in design and conduct of macroeconomic policy in the EMU member countries.

In their analysis of processes for macroeconomic policy coordination in the EU, Jurgen von Hagen and Susanne Mundschenk (2002) aver that fiscal policy coordination of member states of EU in EMU involves Treaty-entrenched guidelines and coordination procedures/modalities targeted at achieving agreed goals. While recognising that fiscal policy remains a national competence for EMU member states, the authorities identify fiscal coordination with two procedures: Excessive Deficit Procedure (EDP) under Article 104 of Treaty, and Stability and Growth Pact (SGP).
Under the procedure for EDP are listed:
(i)   Common rules and objectives;
(ii)   Budgetary surveillance; and
(iii)   Pecuniary sections
The procedures/instruments for the SGP have been the requirement that member states submit annually stability or convergence programmes. The tasks for both the EDP and SGP represent an obligation on member states to achieve medium term budgetary positions close to balance or in surplus.

3.0   THEORETICAL ISSUES

3.1   DEFINITIONS
Fiscal Federalism refers to the scope and structure of the Federal, state and local tiers of governance involving delegation and/or devolution of governmental responsibilities, powers and functions and the allocation of resources and/or means among the tiers of government within a nation state. Put differently, fiscal federalism is the miscellany of financial arrangements and relations among tiers and units of governments as entrenched in the country's Constitution. (Baunsgaard, 2003). Wheare (1963) avers that "If a government is to be federal, its constitution must be supreme... If the general (central) and regional (state) governments are to be coordinated with each other, neither must be in position to override the terms of

their agreement about the power and status which each is to enjoy". Wheare's definition emphasizes the legal aspects, which, however, are not the immediate concern of this paper. It has to be noted that separation of powers may not be accompanied by a separation of finance. Thus states and local governments should not be inclined to the view that their own budgetary activities including borrowing have minimal effects on the national economy. The combined financial decisions of federal, state and local governments have a powerful impact on the national economy. (Premchand, 1983, pages 468-469).

3.2   POLICY COORDINATION

Coordination of economic policies is defined as "....a significant modification of national policies in recognition of international economic interdependence" (Wallich, 1984). Couched in a more operational fashion, policy coordination could be defined as the harmonization of objectives, instruments and institutional and operational arrangements of public debt and monetary management to promote economic stabilization. (Sundararajan and Dattels, 1997). In market economies, such coordination can be achieved through the sharing of common objectives and the pursuit of joint actions to achieve those objectives. It involves putting in place arrangements for the sharing of needed information and of responsibilities to support the execution of monetary and debt policy and the effective pursuit of stabilization goals. In relation to borrowing policy therefore, coordination under the federal system may be conceived as the harmonization of borrowing policies of federal and state governments and their agencies to guarantee a regime of debt and fiscal sustainability of the country in the medium to long-term. It implies shared responsibilities with regard to the following indicators / areas for harmonization:

- choice between external and domestic borrowing;
- the quality of borrowing;
- maintenance of optimal aggregate debt level;
- monitoring compliance with laid down rules and operational guidelines relating to domestic and external borrowing;
- choice of borrowing options with minimal cost and inflationary impact; and
- realization of objective of medium to long-term fiscal and debt sustainability of the country.

Methods of Coordination

Three possible approaches to coordination are discernible but they are complementary one to the other:

- rules versus discretion;
- single versus multiple indicator approaches; and
- hegemonic versus symmetric systems.

Rules-based Approach
The rules-based approach is not entirely devoid of discretion. However, the emphasis on rules derives from the position that rules are regarded as the only viable mechanism for imposing discipline on economic policymakers who might otherwise manipulate the instruments or policy for their own objectives. Besides, rules are regarded as enhancing the predictability of policy actions and thereby improving the private sector's ability to make informed resource allocation decisions.

Single vs. Multiple Indicators Approaches
Even after the choice is made about coordinating via rules or discretion, there remains the decision as to whether to coordinate around a single indicator or area for harmonization or a set of indicators. However, the choice of single or multiple indicators depends on the objectives of policy.

Hegemonic vs. Symmetric System
This is yet another methodological issue associated with coordination – particularly when it involves joint decision making – that is, whether one agency, e.g. the DMO, should by common consent, have a predominant voice on the course of policies, or alternatively whether that influence should be shared more equally with the state government, ministry of finance or the central bank. The former, DMO, in this example is seen as leader– the hegemonic system – while the latter involving the influence of other stakeholders – the state governments, ministry of finance and central bank – may be seen as the symmetric system of coordination.

The approach suggested in this paper is eclectic but it leans heavily on the rules-based method of coordination including harmonization around a set of multiple indicators. Even so some elements of discretionary and hegemonic set of systems as outlined in session 3.2 are expected to be brought on board for fullness of coordination activities.

3.3   CHOICE OF BORROWING OPTIONS
Government's overall financing requirement may be covered by:
* money creation by the central bank (monetary financing or financing through high-powered money or monetary base or reserve money),
* borrowing from the domestic banking system (excluding central bank) and the private sector; and
* external borrowing (concessional and non-concessional). The choice of which mode of financing to adopt depends on which method minimizes costs and risks to the economy. There is no single optimal approach for all circumstances or end-uses as it depends on:
* the economic environment;

- the institutional framework; and
- the degree of development of domestic financial markets (money and capital markets).

Three main factors may help decision-makers to choose among various financing options:
- the macroeconomic repercussions;
- the cost and risks involved (interest rate, foreign exchange and other risks); and
- impact of the proposed borrowing on debt sustainability.

3.3.1   CENTRAL BANK BORROWING
Central Bank borrowing through issuance of monetary policy instruments to finance budget deficit is tantamount to money creation or more generally, it represents increased credit to government by the banking system. However, such borrowing may engender substantial macroeconomic risk, notably pressures on inflation and the balance of payments.

3.3.2   BORROWING FROM DOMESTIC BANKING SYSTEM (EXCLUDING CENTRAL BANK) OR THE PRIVATE SECTOR
This assumes a relatively well developed financial system. It reduces inflationary pressures and the risk of external debt crises. However, this mode of financing tends to have a crowding-out effect on private investment, through a reduction in the private sector supply of loanable funds.

3.3.3   EXTERNAL BORROWING
This is borrowing in foreign currency from non-resident creditors. It often appears attractive because of lesser crowding-out effects on private investment, and reduced risks of inflationary pressures. This is so because government external borrowing does not directly affect domestic interest rates and the supply of loanable funds. Also, external borrowing can bring about an appreciation of the real effective exchange rate (under a fixed or managed exchange rate regime), whereas domestic financing could lead to an increase in interest rates and inflation. However, the above statements about the likely impact of external financing or domestic financing on interest rates and inflation need to be taken with caution. It all depends on whether or not the central bank is able to sterilize the external financing.

External financing aimed at building up foreign exchange reserves may, if the local counterpart is fully sterilized, increase interest rates and crowd out private investment, as does domestic financing. All that could happen following the central banks open market operations aimed at mopping up the excess money

supply from foreign inflows.   However, if the funds are not sterilized, external financing is accompanied by excess domestic demand, and therefore result in much greater pressure on inflation or the balance of payments.   These results may be dramatized with the Polak model:

$$? \quad = \quad ?Cg + ?Cp + ?O \ (net) + ?NF \ - ?Q \quad ..... (1) $$

Where:	M	=	money supply
	Cg	=	credit to government
	Cp	=	credit to the private sector
	OA(net)	=	other assets less other liabilities of the central bank
	NFA	=	net foreign assets
	?	=	change operator

	r	=	r* + d +
Where:	r	=	domestic nominal interest rate
	r*	=	foreign nominal interest rate
	d	=	expected depreciation
		=	risk premium

Under this market condition, the immediate incentive to borrow in foreign currency – a lower interest rate – may be offset by a subsequent depreciation of the exchange rate.   In such market non-concessional borrowing, foreign borrowing which may attract a lower nominal rate, may not be worth taking if the gains will be swamped by the effect of exchange rate depreciation.   A domestic borrowing could then be more attractive.

However, when it comes to borrowing at concessional rates, external borrowing is definitely preferable, because the interest rate is much lower than the market rate. And as such, "interest rate parity" does not hold.

3.3.4   ELEMENTS TO COORDINATE
The elements to coordinate have been listed in section III.2 above. However, a few points need be noted here.

External Borrowing
The coordination of external borrowing would involve giving due regard to existing aggregate debt levels, reserves levels, cost and risk implications of new borrowing and due compliance with the country's borrowing rules or guidelines, etc.

External borrowing by federal, state and local governments is inherently a dynamic activity. It should be effectively coordinated, noting the level of new external borrowing against the existing stock level and the terms on which it may be contracted in order to avoid undue build-up of external debt which could lead to

debt servicing problems in the medium term.   In this regard, coordination of borrowing should have as basic background information, the status of loan portfolio review at both federal and state levels, which will highlight, among other things, the currency composition, maturity profile and interest rate structure of existing and new external borrowing. The loan portfolio review at the Federal level should also give indications of levels of foreign reserves and balance of payment position – a mirror of macroeconomic performance of the external sector.

Integrated external debt management of the country thus has close links with management of the fiscal budget, foreign reserves and the overall balance of payments. These policies – fiscal, reserves, external sector must be coordinated or harmonized with external debt management policy. The effectiveness of external debt management requires both good policies and strong institutions to regulate and coordinate borrowing. Institutional arrangement should also be put in place to facilitate a sufficient flow of information and enhance the degree of coordination among agencies, especially those engaged in external borrowing and reserves management.

Domestic Borrowing
The budget deficit can be covered directly through borrowing by issuance of Treasury Securities or by money creation by the central bank or more generally, by increased credit of the banking system to government. The direct cost can be minimal but macroeconomic risks are substantial. Excessive monetary financing results in excess overall demand, which in turn, translates into inflation or pressure on the balance of payments. Domestic borrowing by government needs to be coordinated with existing stock of government securities, current level of inflation, level of private sector investment and cost of external borrowing etc. It may be preferable to engage in domestic borrowing if external borrowing is under market conditions, that is, on non-concessional terms. This is so because even if the non-concessional interest rate is slightly lower than the rate in the domestic market, the implied nominal interest rate differential will be wiped off by expected exchange rate depreciation – a phenomenon called "Interest Rate Parity".

Therefore care should be taken in choosing between external and domestic borrowing. Even so, domestic borrowing has the capability of crowding out private sector investment, through domestic borrowing-induced reduction in the private sector supply of loanable funds. External borrowing has no such effect on private sector investment, unless of course the local counterpart is fully sterilized, in that case private sector investment may be crowded out.   It is therefore, necessary to coordinate both external and domestic borrowing. Coordination of borrowing, external and domestic, should include a consideration of those issues.

4.0.   THE EFFECTS OF COORDINATION

It is generally problematic separating the impact of a specific macroeconomic policy from other determinants of economic performance. There are in this regard a number of methodological issues that readily come to the fore. Should policy coordination be assessed by relating the results to the objectives of coordination (what is versus what should be)? Or should it be focused instead on a comparison between the outcomes of a specific instance of policy coordination and those that would obtain either in its absence (what is versus what would have been), or in the presence of other possible instance of coordinated policy action (what is versus what could have been)?

The issues posed by those methodological quandaries are thorny. Be that as it may, it is a truism that policy coordination which has developed into a dense network of mutual consultations, policy commitments / cooperation and harmonization (Wallich, 1984) cannot be put in place without beneficial results. Also the negative impact of uncoordinated policy cannot go unnoticed, especially as the consequential externalities hold sway, destabilizing the national economy.

Against the backdrop of difficulties in disentangling the separate effects of coordinated from uncoordinated borrowing policy on macroeconomic performance, it is possible to delineate some findings though not based on any rigorous econometric modeling. While the positive effects of coordinated borrowing, external and domestic, include maintenance of sustainable debt portfolio, and healthy balance of payments position and efficient financial markets, the negative effects of uncoordinated borrowing are devastating and may include:

- emergence of debt overhang with unsustainable debt profile and decline in domestic investment and economic growth;
- deteriorated balance of payments position with downward pressure on the exchange rate;
- capital flight;
- renewed quest for debt relief from the international community and gradual erosion of ownership of domestic macroeconomic management; and
- inefficient and "shallow" financial markets.

All this was the case with Nigeria which in the 1980 and 1990 decade experienced debt overhang following uncoordinated borrowing by both federal and state governments and poor utilisation of borrowed funds.

The analysis above has reviewed the theoretical basis for coordination and the methodological approaches to coordination. It has also reviewed the possible, effects of uncoordinated borrowing in a federal environment. The next section of the paper outlines Nigeria's case study.

5.0   NIGERIA'S CASE STUDY

Fiscal coordination in Nigeria is conducted largely through six instruments:

i.   The 1999 Constitution of the Federal Republic of Nigeria.
ii.   Fiscal strategy paper in the context of the Medium Term Expenditure Framework (MTEF);
iii.   Fiscal Responsibly Act, 2007;
iv.   State governments Fiscal Responsibility Laws and Debt Management Office (DMO) Act, 2003;
v.   Investments and Securities Act, 2007; and
vi.   National Debt Management Framework, 2008-2012

The outcomes of those instruments include consolidated revenue for the entire federation in a Three-year medium term and the guidelines   for borrowing (external and domestic) for all tiers of government, macroeconomic outlook, fiscal balance, etc. The broad areas for coordination are revenue and borrowing. The consolidated Revenue is approved by the National Assembly, based on the Fiscal Strategy Paper (FSP) within the overall three-year MTEF. Based on the consolidated Revenue estimates for the share of states, debt service and the primary balance including debt services are determined. With respect to expenditure, however, the Fiscal framework (FSP) covers only the expenditure of the federal government without incorporating the expenditures of the sub-national jurisdictions as these jurisdictions are autonomous in their spending decisions. On the revenue front, the fiscal frame work for 2010 is provided as illustration. See table 1.

The institutional arrangements involved in generating the fiscal parameters and forecasts involved the Federal and States ministries of finance, Accountant general's office, NNPC, CBN, DMO, etc with the unity of finance playing the hegemonic leader. Regarding borrowing, DMO developed the External Borrowing Guidelines (2008-2012), following Nigeria's exit from the Paris and London Club debt obligations. The office also developed the Sub-national Borrowing Guidelines to guide the Federal and State Governments as well as their Agencies towards external and domestic borrowings with a view to avoiding a relapse into debt un-sustainability. The Guidelines are contained in the National Debt Management Framework, approved by the Federal Executive Council in 2008. The Guidelines were revised and the outcome is a single document comprising guidelines for both external and domestic borrowing for the Federal and State governments as well as their agencies.

Revised Borrowing Guidelines include the provision of responsibilities of the stakeholders in the borrowing process. The guidelines also show the relevant laws supporting the responsibilities of each stakeholder. In addition, it contains an Appendix on Processes and Control Measures for borrowing by the Federal and

State Governments and their Agencies. The Guideline are derived from existing provisions as contained in the Constitution of the Federal Republic of Nigeria, the Debt Management Office (Establishment) Act 2003, the Fiscal Responsibility Act, 2007 and Investments and Securities Act, 2007. The Guidelines are subject to review every 5 years or earlier. See Table 2-4 attached. Thus Fiscal policy coordination in Nigeria (revenue and borrowing) involve commitment of stakeholders/federal and state fiscal authorities and their agencies to agreed indicators and rules for harmonization at the revenue, borrowing and debt fronts with the objective of realising medium to long term fiscal and debt sustainability of the country in the lead up to attainment of overall macroeconomic stability.

5.1 FISCAL RESPONSIBILITY ACT: Part X: The provisions read as follows:

Conditions of borrowing and verification of compliance with limits;

(1)   Any Government in the Federation or its agencies and corporations desirous of borrowing shall, specify the purpose for which the borrowing is intended and present a cost-benefit analysis, detailing the economic and social benefits of the purpose to which the intended borrowing is to be applied.

(2)   Without prejudice to subsection 1 of the section, each borrowing shall comply with the following conditions:
·   the existence of prior authorization in the Appropriation or other Act or Law for the purpose for which the borrowing is to be utilized; and
·   the proceeds of such borrowing shall solely be applied towards long-term capital expenditures.

(3)   Nothing in this section shall be construed to authorize borrowing in excess of the limits set pursuant to section 44 of this Act.

(4)   The Fiscal Responsibility Council shall verify on a quarterly basis, compliance with the limits and conditions for borrowing by each Government in the Federation.

(5)   Without prejudice to the specific responsibilities of the National Assembly and Central Bank of Nigeria, the Debt Management Office shall maintain comprehensive, reliable and current electronic database of internal and external public debts, guaranteeing public access to the information.

Lending by Financial Institutions

(1)   All banks and financial institutions shall request and obtain proof of compliance with the provisions of this Part before lending to any Government in the Federation.

(2)   Lending by banks and financial institutions in contravention of this Part shall be unlawful.

Prohibition against CBN in its relation with government agencies and parastatals.

(1)   The Central Bank of Nigeria in its relations with Government agencies and parastatals shall be subject to the following prohibitions:

- purchasing fresh issues of government securities on the date of its primary issue in the market, except in the circumstances under subsection (2) of this section;

- exchanging on a temporary basis, the debt securities of any Government in the Federation for federal public debt securities   a n d forward purchase or sale of such securities when the final   result is similar to an exchange;

- granting guarantees on behalf of any Government in the Federation.

(2)   The Central Bank of Nigeria may only underwrite securities issued by the Federal Government, which are rolled – over to refinance maturing securities.

(3)   The underwriting permitted under subsection (2) of this section shall be offset through a public auction at market-determined rate.

Power of the Minister to Grant Guarantees

(1)   Subject to the provisions of this Part, the Minister may with the approval of the Federal Executive Council, grant guarantees on behalf of any Government in the Federation.

(2)   Any guarantee granted by the Minister shall be conditional upon the provision of a counter-guarantee in an amount equal to or higher than the guarantee obligation, provided that, there are no overdue obligations from the requesting Government in the Federation to the Guarantor and its controlled corporations and such guarantee shall also be in compliance with the following:

- counter-guarantee shall only be accepted from State or Local

Governments;

- The counter-guarantee required by the Federal Government from State or Local Government or by State from Local Government, may consist in the appropriation of tax revenue directly collected and resulting from statutory transfers and the guarantor shall be authorized to retain such revenue and use the respective amount to repay overdue debts.

(3)   In the case of foreign currency borrowing, Federal Government guarantee shall be a requirement and no State, Local Government or Federal Agency shall, on its own, borrow externally.

(4)   Any guarantee provided in excess of the debt limits set pursuant to subsection (1) of section 44 of this Act shall be unlawful.

External Borrowing, ETC.
(1)   The Office (DMO) shall annually advise the Federal Government on the financing gap for the succeeding financial year and the amounts to be borrowed for bridging the gap both internally and externally.

(2)   Any advice issued by the Office under subsection (1) of this section shall, among other things, form the basis of the national borrowing programme for the succeeding financial year as may be approved by the national Assembly.

(3)   The Office shall participate in the negotiation and acquisition of such loans and credit referred to in subsection (1) of this section.

Execution of External Loan Agreements
An Agreement entered into for the purpose of subsection (1) of section 19 of this Act shall, subject to the provisions of this section, be executed for and on behalf of the Federal Government by the Minister or by such other person as the Minister may, from time to time and in writing, designate for that purpose.

Approval of National Assembly
(1)   No external loan shall be approved or obtained by the Minister unless its terms and conditions shall have been laid before the National Assembly and approved by its resolution.

(2)   The Federal, State Government, or any of their agencies shall not obtain any external loan except with a guarantee by the Minister.

Federal Government Guarantee, ETC

(1)   The Federal Government may, subject to the provisions of this section, guarantee external loans.

(2)   A guarantee agreement for external loans shall be executed on behalf of the Federal Government by the Minister or any other person designated by him in writing.

(3)   The Minister shall not guarantee an external loan unless the terms and conditions of the loan shall have been laid before the National Assembly and approved by its resolution.

(4)   Where any money is due to be paid by the Federal or a State Government in satisfaction of any obligation arising from a borrowing or a guarantee by the Minister, that money shall be deemed to be a charge on the Consolidated Revenue Fund of the Federation or the Consolidated Revenue Fund of the State, as the case any be.

Internal Borrowing

Subject to the provisions of section 7 of this Act in collaboration with the Central Bank of Nigeria, the Office (DMO) shall:

a.   Determine
   (i)   the amounts and timings for the issuance of Federal Government short-term and medium-term securities in the Nigerian money market;

   (ii)   the repayment or roll-over of existing or maturing issues;

   (iii)   the appointment of underwriters to the issues specified in sub-paragraph (i) of paragraph (a) of this subsection to ensure their success;

   (iv)   the flotation of Federal Government long-term securities to raise appropriate funds in the capital market;

   (v)   the payment of interest, maintenance of a register of holders and redemption of securities at maturity;

   (vi)   the creation and management of sinking funds to provide for the redemption of securities at maturity;

b.   In collaboration with the Central Bank of Nigeria and the Accountant-General of the Federation, determine any other form of securities that may be created, issued or floated to achieve the domestic debt management objectives of the federal government.

c.   Review and advise on the maintenance of statutory limits for all categories of loans or debt instrument at levels compatible with economic activities required for sustainable growth and development in collaboration with the Central Bank of Nigeria and the Accountant-General of the Federation; and

d.   Liaise or cooperate with other State Governments or other relevant institutions within or outside Nigeria for the realization of the objectives of the office.

(2)   The Office, for the purpose of achieving the objectives specified in this section, may maintain accounts with the Central Bank of Nigeria as may be deemed necessary.

Lending to the Federal Government etc.

(1)   All banks and financial institutions wishing to lend money to the Federal, State, and Local Governments or any of their agencies shall obtain the prior approval of the Minister.

Approval for Grants or Loans and a Foreign State etc.

(1)   Approval for grants or loans to a foreign state or any international body or any of its agencies may be granted in accordance with the procedure specified in this section.

(2)   Applications for grants or loans to a foreign state may be submitted by the President to the national Assembly and may be approved subject to s u c h terms and conditions as may be prescribed by a resolution of the National Assembly.

(3)   An application specified in subsection (2) of this section shall indicate the:
a.   Foreign policy objectives underlining the request or proposal;
b.   Terms and conditions of the grant or loan;
c.   Benefits which Nigeria stands to derived from the grants or loan; and
d.   State of the relations existing between the foreign state of international body and Nigeria at the time of the request or proposal.

(4) The National Assembly shall, by resolution, decide whether or not the g r a n t or loan should be made.

Loan receipts to form part of Consolidation Revenue Fund of the Federation.
(1) Any monies received in respect of any loan contracted by the Federal Government shall be:
a. Paid into and form part of the Consolidation Revenue Fund of the state;
b. Paid into any other public fund of the State either existing at the time created for the purpose of the loan; and
c. Applied solely for the purpose for which it was obtained and in accordance with the terms and conditions of the agreement under which it was obtained.

(2) Where any amount has become paid out of the monies credited to the Consolidated Revenue Fund of the Federation or of a State or other public fund under subsection (1) or (2) of this section, the amount shall be deemed to be a charge on the Consolidated Revenue Fund of the Federation or of a State, as the case may be or such other public funds into which the monies have been paid.

Terms and Conditions for Loans and Guarantees
(1) The National Assembly may be a resolution approved, from time to time, standard terms and conditions for the negotiation and acceptance of external loans and issuance of guarantees.

(2) Where the National Assembly has approved the terms and conditions under subsections (1) of this section, any agreement entered into by the Federal Government shall come into operation without further reference to the National Assembly: where the terms and conditions are in conformity with the approval.

(3) Notwithstanding the provisions of subsection (2) of this section, the National Assembly may be a resolution request that a particular agreement shall be brought before it for further approval.

(4) No agreement in respect of which the approval of the National Assembly is required shall come into operation without such approval.

(5) An approval shall be deemed granted if after 30 days the approval has not been formally communicated to the Minister.

5.2   ILLUSTRATION FROM NIGERIA

Table 1 below, presents the revenue and expenditure of States' governments in Nigeria for the period 1980-2008. Periods of high revenue reflect increase revenues from oil because States' own revenue are only 14 percent of total revenue. Consequently, States are heavily dependent on the centre for resources to manage their States (Ekpo, 1994; Ekpo,2005, Ekpo and Ubok-Udom, 2003).

The revenue fluctuates based on the dictates of the global oil market. However, expenditures increased steadily throughout the period 1980 - 2008. Total expenditure which stood at N7233.8 million in 1980 rose to N20,049.3 in 1990 and by 2008 it was N2,899,537.0 million; what is interesting is that throughout the period except for 1997 and 1999, States were characterised by deficits; these deficits are quite large in magnitude. Therefore, if the deficits are not accounted for in the fiscal consolidation at the centre, then the overall fiscal policy of the country would not be robust (see Table and figures below).

Therefore, for a country like Nigeria, fiscal coordination even at the level of budgeting is important. On the other hand in Table 2, for the period 2000-2008, Local government exhibited budget surplus except for the year 2000 and 2008. Nonetheless, the expenditure even at the local government level is quite substantial to be part of the reaction function of the federal government's fiscal equation.

Table 1: State Governments' Revenue, Expenditure and
Surplus or Deficits (₦ Million) 1980-2008

Year	Revenue	Expenditure	Surplus/Deficits as % GDP
1980	3817.1	7233.8	-3417
1981	4874.8	10990.9	-6117
1982	4561.5	10680.5	-6119
1983	4392.4	11090.9	-6699
1984	4400.9	7064.9	-2664
1985	4844.9	5857.7	-1013
1986	4704.4	5774.7	-1071
1987	8156.6	8263.5	-107
1988	10360.1	10778.5	-419
1989	11502.1	12974.7	-1473
1990	19967.4	20049.3	-82
1991	24772.2	27023.7	-2252
1992	32673.6	37060.6	-4387
1993	37740.6	44180.7	-6441
1994	49506.1	55916.2	-6411
1995	69641.7	77897.6	-8254
1996	89529.1	83987.6	5542
1997	96962.6	92686.2	4277
1988	143202.5	148132.8	-49931
1999	168990.1	16789.1	152201
2000	359072.1	359670.6	-599
2001	573548.2	596956.4	-23409
2002	669817.7	724537.2	-54720
2003	354997.1	921159.7	-566163
2004	1113944	1125057.0	-11113
2005	1413770	1478585.0	-58948
2006	1543770	1586797.0	-43027
2007	2065406	2116139.0	-50733
2008	2852135	2899537.0	-47402

Source: CBN Annual Report and Statement of Accounts, Abuja

Table 2: Local Governments' Revenue, Expenditure and Surplus or Deficit 2000-2008

Year	Revenue	Expenditure	Surplus/Deficits
2000	151877.3	153864.8	-1988
2001	171523.1	171374.5	149
2002	172151.1	169820.2	2331
2003	370170.9	361713.2	8458
2004	468295.2	461050.6	7245
2005	597219.1	587977.8	9242
2006	674255.7	665838.0	8418
2007	832300	827400.0	4900
2008	1387871	1387900.0	-29

Source: Central Bank of Nigeria: Statistical Bulletin 2010, Abuja

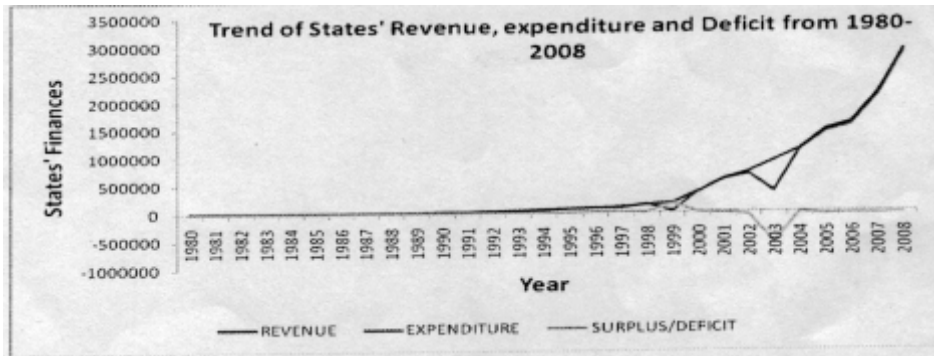Figure 1: Trend of States' Revenue, Expenditure and Deficit (1980 – 2008)

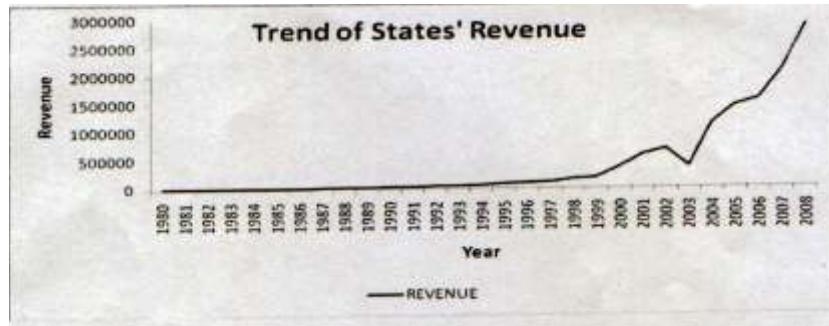Figure 2: Trend of States' Revenue (1980 – 2008)
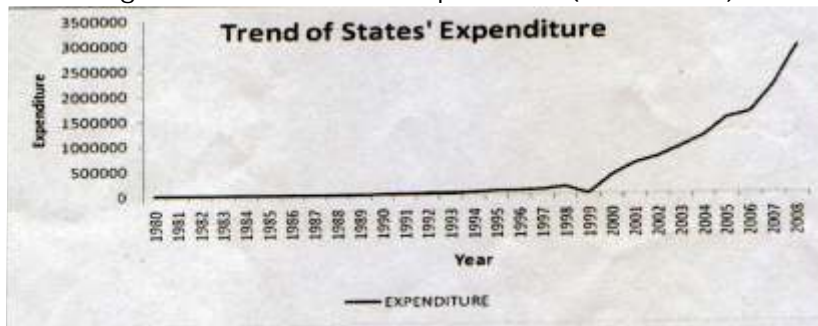

Figure3: Trend of States' Expenditure (1980 – 2008)
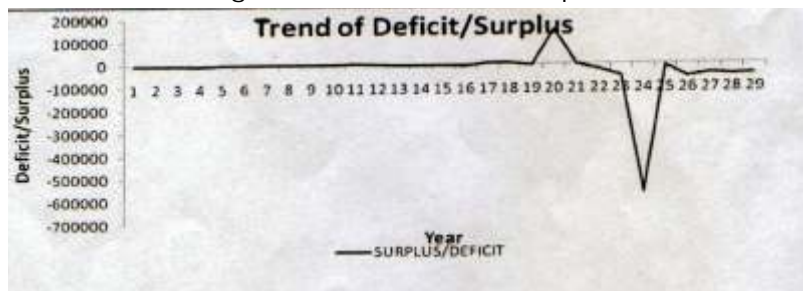

Figure3: Trend of Deficit/Surplus

Table 3 below shows the trend in State Governments' external debt stock for the period 2004-2010. The external debt stock decreased sharply from US$7,726.20 million in 2004 to US$1,400.34 million in 2006 due to the Paris Club debt exit signed in 2005 and finalized in April 2008, as well as the exit from the loan club (Par bond) debt obligations in 2006-2007. The increasing trend from 2007 was due to the upscale in new disbursements. These loans were used to finance infrastructural projects in the areas of education, health, water supply and sanitation

The illustrations provided in Tables 2 and 3 and the associated figures are meant to demonstrate the importance of SNGs regarding fiscal policy coordination. It is thus important that policy-makers consider the fiscal behaviour of other tiers of government in the macroeconomic management of their economies. The large deficits in various years must be accounted for in the budget and /or reaction functions of the central bank; otherwise, monetary policy may become also ineffective.

Table 3: Trend in State Governments' External Debt Stock - Nigeria, 2004-2008
(US$Million)

Year	State Government External Debt
2004	7,726.20
2005	5,061.15
2006	1,400.34
2007	1,539.93
2008	1,660.49
2009	1,820.71
2010	2000.70
Average	3029.93

Source: Debt Management office, Abuja

5.3   WAY FORWARD
Overcoming the Challenges of Fiscal Policy Coordination
Fiscal policy coordination may be difficult to implement especially in a federal system. The highlights of some of the challenges and suggestions to overcome them based, to some extent, on the experience of other countries, are presented as follows:

• Fiscal discipline and strict expenditure controls, otherwise expenditure would tend to follow revenue during booms and excessive deficits during burst. It is more often difficult to control expenditure especially during an economic downturn. Nonetheless, fiscal rules rather than discretion must guide overall fiscal policy- sub-national governments should be disciplined from borrowing and there should be no

bail outs for SNGs that exhibits fiscal 'rascality'. It may be necessary to enforce a hard budget constraint regime. In order to ensure fiscal discipline, some countries like Brazil, Argentina, South Africa, India, Mexico and Chile have enacted Fiscal Responsibility laws to enhance fiscal prudence by ensuring that SNGs are legally committed to transparent, fiscal and budget practices. Nigeria has a Fiscal Responsibility Act (FRA) at the centre and about 18 states have either enacted their own FRAS or about to do so. It may therefore be necessary for countries in the sub-region to be committed to passing the FRAs to ensure fiscal coordination and eventual fiscal discipline as a monetary union.

- There is the need to enact and enforce procurement laws to control expenditure, reduce waste and corruption in the award of contracts.

- To deal with the challenge of exogenous and volatile sources of revenue particularly as regards non-renewal resources, it is important to have a Reserve Fund to address the issue of unanticipated positive and negative shocks. Several countries have stabilization funds into which a specified proportion of the share of revenue from these sources is paid. For example, in Kuwait, a Reserve Fund for Future Generations (RFFG) was created in 1976 and 10 percent of the revenue from oil is often paid into the Fund to protect public investment and social programmes from the impact of a fall in global price of oil. In Venezuela, a macroeconomic stabilization fund was established in 1998 to help smooth expenditures. Nigeria recently established a Sovereign Wealth Fund to address matters of savings, investment and infrastructural development, stabilization and intergenerational equity. It seems plausible to suggest that countries in the sub-region create Reserve Funds for dealing with the problems of uncertainty in revenue streams and the non-renewable nature of mineral resources.

- It is important to reduce dependence on mineral/commodity sources of revenue by diversifying the economies in the region; policy should stress production and some form of manufacturing for export.

- Concerning endemic corruption, government in the sub-region need to enforce anti-corruption laws and co-operate across countries in the fight against money laundering and related crimes. In Nigeria, the Economic and Financial Crime Commission (EFCC) and ICPC were established to fight corruption and looting of the treasury. Since similar bodies exist in other countries in the sub-region, there is the need to cooperate and exchange information to combat the crime of corruption and thus free resources for development.

- Overborrowing widens budget deficits through excessive debt service payments. Overborrowing by all tiers of government could be avoided by strict monitoring and compliance with all the guidelines laid down for both domestic and external borrowing by all tiers of government. The guidelines are

well presented in the case of Nigeria, in the Debt Management Office (DMO) Act of 2003 and the Fiscal Responsibility Bill of 2004.

- Coordination of fiscal policy must include coordination of monetary policy with external reserved policy and balance of payment policy in order to achieve and sustain fiscal and debt sustainability in the medium to long-term.

- Recently, the Nigeria Economic Report (NER) of the World Bank argues that the Nigeria Federalist System has the potential to support Nigeria's take off into rapid diversified growth and job creation, but the Federal and State Governments need to improve cooperation and policy coordination in a few key areas. These key areas are :

  a.   Macroeconomic management (countercyclical Fiscal Policy);

  b.   Coordination of policies to enhance market connectivity and improve public services; and

  c.   The realization of national standards in public financial management and disclosure.

6.0   CONCLUSION

This paper has reviewed relevant issues regarding the concepts and operational modalities for fiscal policy coordination, with some illustration from Nigeria's experience. It identifies fiscal policy coordination in a Federation as a procedure that focuses on budget deficits and debt of central and sub-national jurisdictions with a view to commitment to a set of rules for realization of common objectives, notably, fiscal cum debt sustainability and ultimately macroeconomic stability. Coordination involves negotiations and agreements on the various elements to harmonize on the revenue and debt fronts, without consideration for expenditure harmonization considering that the sub-national jurisdictions in Nigeria are autonomous in their expenditure decisions. Thus, the paper has adopted a narrow agenda focusing on agreed procedures for revenue generation and sharing among the 36 states of the federation as well as borrowing.

It argues that regardless of whether policy coordination should be among the decision makers from the fiscal authorities across the federation or across the states in a monetary union setting or between decision makers in the areas of monetary and fiscal policy within a federation, policy coordination should be undertaken at two levels: first, addressing the constraints/ issues regarding the operational procedures of policy and second, dealing with the issues of macroeconomic effects that would arise from lack of coordination .

However, the paper reckons that coordination under any level should not be difficult if all stakeholders embraced the common goals—fiscal and debt sustainability and macroeconomic stability. In practice however, coordination

involves haggling and negotiating and/or take the form of some policy rules or guidelines, but nevertheless these may be arrived at within the parameter of some common goals.

Of importance is the review of Nigeria's case study where coordination is limited to revenue generation and sharing among the tiers of government and guidelines on external and domestic borrowing by federal and state governments.

The nagging issue in fiscal policy coordination in Nigeria is the inability of a great many sub-national jurisdictions to implement agreed guidelines especially on borrowing. In this regard, it is disheartening that although the Fiscal Responsibility Act, 2007 has since been passed into law since 2004, fewer than 10 states out of 36 states of the Federation have adopted it. Besides, a great many states have not set up debt management units in their ministries of finance, reflecting low executive capacity and inadequate political priority. As evident in the monotonic rise in the trend of budget deficits and debt levels of sub-national jurisdictions in the period of 2000-2008, fiscal policy coordination in Nigeria seems weak and ineffective despite the impressive array of institutional arrangements and instruments already put in place for the purpose.

It bears repeating that as the West African sub-region moves towards economic integration, the coordination of fiscal policy within each country is a prerequisite for overall fiscal coordination of the union. It is apparent that to ensure fiscal prudence, countries in the sub-region should enact and implement Fiscal Responsibility and Public Procurement Laws. For this requirement to materialize, political commitment and high executive capacity are vital preconditions.

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THE INFLATION AND ECONOMIC GROWTH NEXUS IN ECOWAS COUNTRIES: AN EMPIRICAL INVESTIGATION

By Patricia A. Adamu[2]

ABSTRACT

This paper has attempted to investigate the impact of inflation on economic growth in the countries of the Economic Community of West African States (ECOWAS) using data for 2001-2012 for all 15 member countries. Panel data econometrics was undertaken, using the Fixed Effects Model to estimate the required regression coefficients. Economic growth was measured by the growth rate of real income and the explanatory variables included are, the inflation rate, the ratio of balance of payments to GDP, and the growth rates of exports, FDI and aggregate investment. Inflation was found to be significantly and negatively related to economic growth. This implies that high levels of inflation would tend to retard economic growth, while low rates of inflation would spur economic growth. The other key variable that had a positive and significant impact on economic growth was the growth rate of real investment. The growth rate of FDI was highly significant but negatively related to economic growth. The negative relationship could be attributable to the fact that high and volatile FDI inflows often trigger a real adjustment that is inimical to long-run economic growth. In order to curtail the upsurge in the general price level that would inhibit sustainable economic growth, improved domestic macroeconomic policy environment in terms of appropriate monetary and fiscal policies is warranted. This would require the consistent pursuit of measures to reduce fiscal deficits and external debt, promote viable balance of payments and the maintenance of a realistic real exchange rate. In addition, the countries of ECOWAS should liberalize their FDI regimes, provide adequate legal and institutional framework to protect foreign investors, improve governance, and improve the overall investment climate.

JEL Classification: C31, C33, E31, E63, E64, O40

Keywords: Inflation rate; economic growth; ECOWAS; panel data modeling; fixed effects model; random effects model

1.0   INTRODUCTION

The achievement of price stability and sustained growth are the major goals of macroeconomic policy in modern economies. It is assumed that relatively stable and predictable inflation can have a positive effect on the growth of an economy. The presumption is based on the idea that a benign and stable inflation is less damaging than hyperinflation at which prices are out of control. A low and stable rate of inflation will result in higher revenues and profits for businesses and boost investment and productivity. The fiscal drag effects will be beneficial to

government as its revenue from tax (ad-valorem tax) will increase, and the real value of outstanding debts will be reduced. All this will provide the government more revenue for infrastructural development, and promote economic growth. An increase in inflation in the domestic economy would increase prices of importables. The transmission mechanism is likely to be through increase in money supply, as well as, government spending. High and volatile inflation has economic and social costs, and a spiral effect on the economy. It increases cost of production and raises the cost of living, and labour would agitate for increases in wages and salaries ('wage-price spiral'). Thus, a high and volatile inflation rate is likely to be inimical to economic growth.

In the presence of high inflation rates in the international sphere, home exports become more expensive, leading to a fall in exports. This loss of international competitiveness would continue to worsen and, all things being equal, culminate in a payments deficit. As the condition persists and gets worse, the currency is devalued to become more competitive. As a result of the devaluation exports become cheaper abroad but the country has to pay more for imports, as they become more expensive. The increased cost of imports in turn increases domestic prices, particularly if such anticipated increase was not allowed for when deciding the extent to which the local currency is to be devalued. The final analysis is that devaluation reduces the standard of living of the exporting countries, because it makes imports more expensive, but exports cheaper. Therefore, the devaluing country will have to produce and sell a greater volume of exports so as to earn as much foreign currency as it did before devaluation in order to improve the balance of payments (BOP) position, and benefit from the devaluation.

This study intends to investigate the effect of inflation on economic growth in ECOWAS[3] countries. A review of extant literature indicates that, no study has been done on ECOWAS in this regard. This paper is structured into six sections. Following the introductory section is section 2, which reviews relevant literature. Section 3 presents stylized facts on the macroeconomic performance in ECOWAS countries. Section 4 discusses the conceptual framework and the model, while section five presents and analyzes the econometric results. Section 6 summarizes and concludes the paper.

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[3] ECOWAS comprises fifteen countries, namely, Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

2.0   LITERATURE REVIEW

Considerable empirical work on the relationship between inflation and growth has been undertaken with mixed results. Fisher (1993) identifies a non-linear relationship where low inflation rates have a positive impact on growth which turns negative as inflation rates increase. Bruno and Easterly (1998) corroborate the finding of a negative effect for high inflation rates but are skeptical about the growth enhancing effect of low inflation. Many studies have found a negative relationship between inflation and economic growth. (Barro, 2013; Chimobi, 2010; Quartey, 2010; Ahmed and Mortaza, 2005; Shitundu and Luvanda, 2000; Barro, 1995; Fisher, 1993); while other studies finds a positive correlation between inflation and economic growth. (Umaru, 2012; Mallik and Chowdhury, 2001; Hasley, 1997; Barro, 1996). In particular, Mubarik (2005) found that low and stable inflation promotes economic growth, while a high level of inflation retards growth. Umaru (2012) affirms that the positive correlation between inflation and economic growth arises through the effects of inflation on productivity which impacts positively on output, and hence, improved economic performance.

For countries that have not attained full employment, there is a general consensus among economists that some level of inflation would spur growth in such countries. In other words, there is a threshold level of inflation that will enhance growth, after which it inhibits growth, although, there is no accord among economists as to the accepted threshold of inflation in different countries. Bruno and Easterly (1995) study shows that inflation crisis will materialize when the inflation rate reaches 40 percent and above. Fisher (1993) finds that a threshold of inflation that is 11 percent and less than 12 percent will contribute significantly to growth. Khan and Senhadji (2001) estimate a threshold of 11 percent for developing countries where inflation rates above this threshold are associated with a significant negative effect on growth, while inflation rates below 11 percent do not have any significant impact. Frimpong and Oteng-Abayie, (2010) are also agreeable to the 11 percent threshold effect of inflation on economic growth for Ghana over the period 1960-2008. Still on Ghana, Marbuah, (2010) finds evidence of significant threshold effect of inflation on economic growth with minimum and maximum inflation threshold levels of 6 and 10 percent respectively. His conclusion is that inflation targets below 10 percent will enhance growth, but could be detrimental to Ghana's growth prospects if it is beyond the 10 percent threshold. However, Hasanov, (2010) finds a 13 percent threshold level of inflation would propel growth, but when it exceeds 13 percent, the effect becomes negative. Espinoza et al. (2010) present results which indicate that inflation of more than 13 percent is detrimental to real non-oil GDP. Sergii (2009) contends that inflation below 8 percent promotes growth, and tends to slow down economic growth if above 8 percent.

From the analysis thus far, it is obvious that there is no consensus on the appropriate

threshold level that would spur growth. Nonetheless, a very high inflation will slow down growth, while a low or moderate inflation will benefit growth, all things being equal. However, Sarel (1996) notes that inflation rates were somewhat modest in most countries before the 1970s but rose thereafter. He then cautions that most empirical studies conducted before the 1970s show evidence of a positive relationship between inflation and economic growth and a negative relationship thereafter as a result of high inflationary pressures.

Persistent and high levels of inflation would reduce people's welfare and retard growth, because the composition of total output shifts away from consumption goods to financial services, (Kaldor, 1961). This was also supported by Tobin (1965) in his portfolio analysis. He finds that during inflationary period, people move away from holding money to investing in capital goods. Fixed income earners suffer a lot during acute inflation because the real value of money falls, hence, a reduction in their purchasing power.

Several factors have been identified as influencing the level of inflation. These include; fiscal, monetary, external, institutional and structural factors. Large budget deficits, excess liquidity, balance of payments deficits and subsequent devaluation, political interference in the operations of the central banks, especially in developing countries, have elevated inflationary pressures, (Essien, 2005; Odusola and Akinlo, 2001; Agenor and Hoffmaister, 1997; Moser, 1995; Alisina and Summers, 1993; Melberg, 1992; Cukierman, Webb and Neyapti, 1992). However, good harvest and increased output have tended to subdue inflationary pressures

Umaru (2012) has identified six costs of inflation in the literature. These include: shoe leather costs, menu costs, unintended changes in tax liabilities, arbitrary redistribution of wealth, uncertainty, and increased variability of relative prices. The shoe leather costs occur when economic agents have an incentive to minimize their cash holdings and prefer to hold cash in interest bearing accounts due to the loss in the value of currency. Menu costs of inflation itemize all the inconvenience that individuals and firms face as price lists are updated frequently and price labels are changed. This diverts the attention of economic agents from other more productive ventures. Unintended changes in tax liabilities, say a reduction may be treated as real gains when incomes are unadjusted. This arises because, with a progressive taxation, rising nominal incomes are taxed more. Wealth is redistributed between debtors and creditors, which may otherwise be unacceptable, with unexpected or incorrectly anticipated inflation. Uncertainty becomes a cost, when in periods of volatile inflation, investors/firms may be reluctant to invest in new equipment; individuals will be unwilling to spend as they are unsure of what government would do next. Through increased variability in relative prices, rising inflation would reduce

the competitiveness of a country in the international market for goods and services. The negative effect of this on the balance of payments cannot be overemphasized.

Inflation affects the external sector through its effect on exchange rates, and hence the balance of payments. Under fixed exchange rates, inflation reduces exports and makes a nation less competitive, while at the same time, it increases imports. With greater degree of openness, inflation will be exported from one country to another. But under a flexible exchange rate regime, we should not expect systematic international trade changes to flow from differential inflation rates, unless there is a time lag in the rate at which exchange values adjust in response to differential inflation, then the country experiencing higher inflation will experience a reduction in its exports and an increase in imports, (Houck, 1979). This is because the value of its currency will not fall rapidly to maintain equal commodity price relatives.

3.0   STYLIZED FACTS ON THE MACROECONOMIC PERFORMANCE IN ECOWAS COUNTRIES

During the period of study, the average annual inflation rate ranged from 2.19 to 15.68 percent in ECOWAS countries. Of the 15 countries of ECOWAS, 10 recorded single digit inflation on the average during 2002 – 2012 period. Senegal had the least average inflation rate of 2.19, while Ghana had the highest average inflation rate of 15.7 percent. The average growth rate in merchandise exports was highest in The Gambia with 51.4 percent, and lowest in Guinea with 7.5 percent. On the average, real GDP growth rate was highest in Nigeria, followed by Cape Verde. Both countries recorded 15.14 and 10.76 percent, respectively. All other countries, apart from Sierra Leone had below 10 percent, with Guinea Bissau recording 0.63 percent. The average growth rate of real investment in the countries in ECOWAS was less than 30 percent during the period of study, with the exception of Liberia that recorded the highest average of 47.6 percent, followed by Sierra Leone with 30.33 percent. Guinea Bissau posted the lowest average growth in real investment of 0.5 percent (see Table 1 below). Given the low level of investment in the countries of ECOWAS, additional income in the form of foreign direct investment inflows is clearly warranted if there is to be rapid and sustainable development of these countries. The average level of gross international reserves was highest in Guinea Bissau with 7.7 months of import cover. Benin, Burkina Faso, The Gambia, Mali, Niger, Nigeria, Senegal and Sierra Leone also recorded reserves that could cover more than 3 months of imports. It is well known that inadequacy of international reserves tends to complicate macroeconomic management and exacerbate the deleterious effects of negative international shocks, (Adamu and Oriakhi, 2013). During the 2002 and 2012 period, on average, all the countries witnessed a deficit in the balance of payments-income ratio with the exception of Nigeria and Cote d'Ivoire that recorded positive ratios. (For details, see Table 1 below).

Table 1: Macroeconomic Performance in ECOWAS: 2002–2012 average (%)

	Inflation	Real GDP	Exports	FDI	Investment	Reserves (Months of Imports)	BOPYR
Benin	2.92	2.52	10.69	11.70	12.32	7.5	-8.24
Burkina Faso	6.66	6.66	25.89	120.55	20.38	4.4	-7.76
Cape Verde	2.63	10.76	18.75	29.98	14.09	2.3	-0.14
Cote d'Ivoire	2.97	7.58	11.32	5.86	12.62	2.8	3.32
Gambia	6.66	0.75	51.43	16.01	18.93	3.9	-10.62
Ghana	15.68	9.80	20.55	62.28	17.94	2.7	-7.64
Guinea	15.29	3.95	7.48	258.01	27.77	2.4	-9.58
Guinea Bissau	2.70	0.63	11.37	190.54	0.50	7.7	-3.52
Liberia	10.24	0.87	17.32	1238.43	47.62	0.4	-29.05
Mali	2.99	6.82	11.59	-16.40	12.90	4.9	-7.20
Niger	2.75	4.16	17.27	99.75	26.58	3.1	-13.81
Nigeria	12.68	15.14	21.24	27.72	25.61	7.4	6.94
Senegal	2.19	10.18	9.18	33.07	17.60	3.6	-8.34
Sierra Leone	12.79	2.09	36.83	96.21	30.33	3.1	-11.84
Togo	2.92	2.52	10.69	15.51	12.72	2.7	-8.24

Where: BOPYR = Balance of Payments-GDP ratio
Source: Author's Calculations from WDI, 2012

The average share of FDI inflows as a percentage of GDP during the period 2000 - 2009 in Liberia, Cape Verde and Ghana was 12 percent, 11 percent and 8 percent respectively, while Nigeria had about 6 percent of GDP. All other countries' share of FDI was below 5 percent of GDP. (See Fig. 1 below for details).

Fig1: FDI flows to ECOWAS (% of GDP): 2000-2009 averages
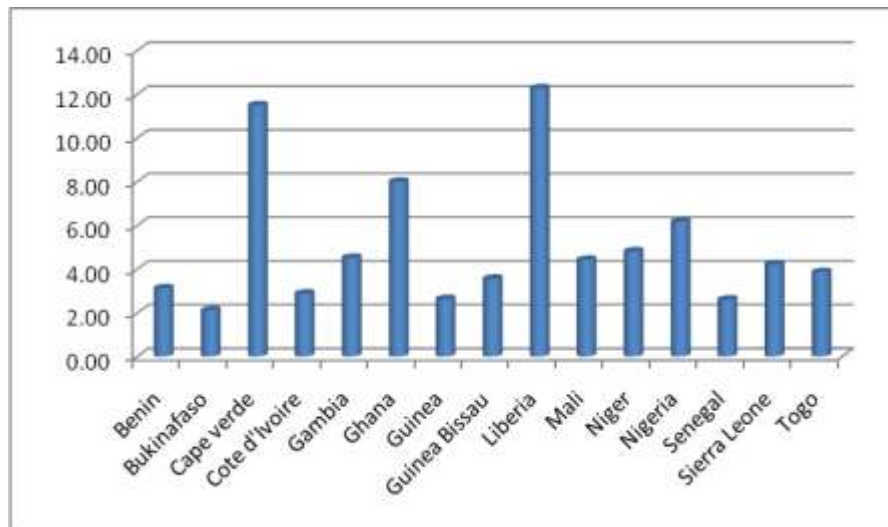
Source: Author's Calculations from WDI, 2012

4.0   CONCEPTUAL FRAMEWORK AND METHODOLOGY

Inflation is a significant and sustained increase in the general price level. The three dominant schools of thought on the causes of inflation are; the neo-classical/monetarists, neo-Keynesian, and structuralists. The neo-classical/monetarists view inflation as a monetary phenomenon because a high inflation rate for any sustained period of time increases the rate of money supply. Hence, it is often said that inflation is caused by excess supply of money. The quantity theory of money pioneered by Irving Fisher, asserted that changes in the general level of commodity prices are primarily determined by changes in the quantity of money in circulation. However, this view was contradicted by Hamilton (2001) and Colander (1995) who posit that the money supply growth rates in the US increased faster than prices, due to the increased demand for the US dollar as a global trade currency.

The neo-Keynesian attributes inflation to diminishing returns to production. According to Umaru (2012), this arises when there is an increase in the velocity of money and excess of current consumption over investment. Keynes and neo-Keynesians emphasize increase in aggregate demand over aggregate supply as the source of demand pull inflation, and at full employment level, the inflationary gap rises.

The structuralists ascribe the cause of inflation to structural factors underlying characteristics of an economy (Adamson, 2000). For instance, in the developing countries, particularly those with a strong underground economy, ubiquitous hoarding or hedging and expectations of future rise in prices, would make economic agents to increase their demand for goods and services. Thus, the increase in demand is not only transactionary, but also precautionary. This creates artificial shortages of goods and reinforces inflationary pressures. In other words, they see inflation as emanating from structural rigidities especially in developing countries. The transmission mechanism is explained thus: An increase in demand for agricultural products with inelastic domestic supply would make prices of such products to rise. Again, if imports, whose prices are usually higher, are made to supplement domestic supply or meet the high demand, the general price level will rise, and labour will agitate for wage increases to compensate for the fall in real incomes. This will in turn raise cost of production and result in higher inflation in the economy. However, the structuralists maintain that inflation is necessary for growth. The question is what is the acceptable threshold of inflation that would spur growth?

4.1   THE MODEL

Consider the standard neoclassical production function of the form:

$$Y = f(A, K, L) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.1)$$

Where A is the level of technology, K is the capital stock, L is the quantity of labor and Y is output. Assume that the production function is twice differentiable and subject to constant returns to scale, and that technical change is Hicks-neutral. If we differentiate equation (4.1) with respect to time, divide by Y and rearrange the terms, we have:

$$\acute{Y}/Y = \acute{A}/A + (F_K K/Y)\,?(\ /K) + (F_L L/Y)\,?(\ /L) \dots\dots\dots\dots\dots\dots\dots\dots (4.2)$$

Where: $\acute{Y}/Y$ is the continuous time rate of growth of output, $/K$ is the rate of growth of capital stock and $/L$ is the rate of growth of labor force; F_K and F_L are the (social) marginal products of capital and labor, respectively; and $\acute{A}/A$ is the Hicks-neutral rate of change of technological progress. Thus, the basic Solow (exogenous) growth model gives the growth rate of output or income as depending on the rate of growth of technical change, capital stock (often proxied by investment) and labor or population. In empirical applications, this basic Solow model has been modified to obtain the augmented Solow growth model where the rate of growth of income for a given country depends not only on technical change, labor and capital but also on policy variables like trade, fiscal policy, and monetary policy. For details, see Ologu (2003), Easterly and Levine (2001), Mankiw et al (1992), and Barro (1991).

In this paper, the list of policy variables is expanded to include capital inflows, with FDI representing private foreign capital inflows. Since this study is on the impact of inflation on economic growth in ECOWAS countries, inflation is included together with other variables such as the ratio of balance of payments to GDP and growth in exports to the augmented Solow Neoclassical theory of economic growth, to obtain the following specification for the determinants of economic growth in any country in any given year:

$$gRY_t = a0 + a1INF_t + a2BOPYR_t + \ 3gXP_t + a\ 4gFDI_t + a5gINV_t + u_t \dots\dots (4.3)$$

Where:

g	=	percent growth rate
RY	=	real GDP
INF	=	inflation rate (%)
BOPYR	=	ratio of BOP to GDP (%)
XP	=	value of merchandise exports
FDI	=	foreign direct investment
INV	=	aggregate real investment
u_t	=	stochastic error term (assumed to be Gaussian white noise)

From a priori considerations, it is expected that the ratio of balance of payments to GDP, exports, FDI inflows, and aggregate investment will be positively related to real GDP, a measure of economic growth. However, the inflation rate is expected to be inversely related to real GDP growth rate.

This paper considers a study of 15 ECOWAS countries over a period of 12 years, suggesting the use of panel data, which is also known as times series of cross sections. The model is now re-specified as follows:

Let us consider a panel of i countries, observed over t periods of time as to the evolution of their GDP growth rate, gRYit (i=1,2…….Z; t=1,2,……...T) . Therefore, following Baltagi et al (2007), the basic model is specified for the empirical analysis of the determinants of economic growth in ECOWAS countries:

$$gRYit = \; 0 + \; 1INFit + \; 2BOPYRit + \; 3gXPit + \; 4gFDIit + \; 5gINVit + uit \;….. (4.4)$$

Where:
i is the country index;
t stands for time in years;
all the other variables are as already defined; and
$u_{it} = \; U_i + V_t + W_{it}$

4.2   ESTIMATION METHODOLOGY

It can be seen that equation (4.4) conforms to the "Error Components Model": first introduced by Balestra and Nerlove (1966), expanded by Swamy and Arora (1972), and Wallace and Hussain (1990), and popularized by Baltagi (1995) and others. This nomenclature derives from the fact that there are 3 error components, viz., a spatial (country) component (Ui), a time component (Vt), and a random component (Wit). The time component allows the impact of the explanatory variables on economic growth to vary over time in each country while the country component permits the impact of the explanatory variables on economic growth to vary across the countries in the sample. This study conducts the panel data analysis with the Fixed Effects and Random Effects estimation methods. The GRETL econometric software is utilized for the regression analysis.

4.3   SOURCES OF DATA

Annual data for real GDP, inflation rate, balance of payments, merchandise exports, aggregate investment, and exchange rate are all obtained from the IMF statistical database, 2012, World Bank Indicators, 2012, and Global Development Finance, 2012. The data set is for the period 2001 – 2012, and for the 15 ECOWAS countries.

5.0   ANALYSIS OF ECONOMETRIC RESULTS

5.1   CHOICE OF MODEL

When estimating equations with panel data, a question that often arises is which panel method to use, fixed effects or random effects? One way of answering this poser is to relate it to the nature of the data set being utilized. If the panel involves observations on a fixed and relatively small set of units of interest (say, the member countries of ECOWAS), there is a presumption in favour of fixed effects. On the other hand, if it deals with observations on a large number of randomly selected individuals (as occurs in epidemiological studies), then there is a presumption in favour of random effects. In addition to this purely heuristic reasoning, there are also some statistical tests which can assist in the choice of estimating method. Using a priori logical reasoning and all the available statistical tests (see a discussion of the Hausman test below), the conclusion reached is that, for this study, the most appropriate estimating technique is the Fixed Effects Model.

Note that the Hausman test allows for a choice between Fixed Effects Model and Random Effects Model by investigating the consistency of the Generalized Least Squares (GLS) estimate. From the econometric results of the Random Effects model reported in Appendix 1, it is seen that the Chi-Square (5) test statistic equals 3.26. Since the Chi-square test statistic is small (with a p-value of 0.66), it is not significantly different from zero even at the 10 percent significant level. Accordingly, the null hypothesis that the GLS estimates are consistent is rejected. This suggests that the random effects estimator is not consistent and that the fixed-effects model is preferable. Thus, the Fixed Effects model dominates the Random Effects model for this study.

Therefore, in what follows, a detailed analysis is provided on the econometric results obtained by using the Fixed Effects Model. It should be emphasized that the Fixed Effects Model (FEM) allows for different y-intercepts, that is, it allows for country-specific constant terms.

The econometric results obtained by using the Fixed Effects model for the multiple regression equation (4.4) are presented below. For completeness, the econometric estimates for the multiple regression equation using the two-step dynamic pooled OLS estimator are also reported in the Appendix (see Appendix 2 for details). The coefficient estimates were calculated using the GRETL software. Note that 3 stars (***) indicates that a regression coefficient is significantly different from zero at the 1% level; 2 stars (**) indicates that a regression coefficient is significantly different from zero at the 5% level; and 1 star (*) indicates that an estimated regression coefficient is significantly different from zero at the 10% level. The total absence of stars indicates that the regression coefficient is not significantly different from zero

even at the 10% level.

5.2   RESULTS OF THE EMPIRICAL GROWTH EQUATION (4.4) USING THE FIXED EFFECTS
       MODEL

Model 1: Fixed-effects, using 165 observations
Included 15 cross-sectional units
Time-series length = 11
Dependent variable: gRY

	Coefficient	Std. Error	t-ratio	p-value	
Const	13.2433	4.61333	2.8707	0.00476	***
INF	-0.655732	0.324493	-2.0208	0.04528	**
BOPYR	-0.130509	0.180171	-0.7244	0.47010	
gXP	0.0291153	0.031499	0.9243	0.35697	
gFDI	-0.00302114	0.00120916	-2.4985	0.01367	**
gINV	0.0710039	0.0346576	2.0487	0.04243	**
dt_2	12.8391	5.36532	2.3930	0.01809	**
dt_3	1.4451	5.25693	0.2749	0.78382	
dt_4	-0.177818	5.27865	-0.0337	0.97318	
dt_5	2.53157	5.26638	0.4807	0.63151	
dt_6	7.05003	5.27988	1.3353	0.18404	
dt_7	7.51464	5.37693	1.3976	0.16453	
dt_8	-10.7832	5.32283	-2.0258	0.04475	**
dt_9	-4.41933	5.32526	-0.8299	0.40807	
dt_10	-0.892878	5.43397	-0.1643	0.86973	
dt_11	-5.35006	5.39196	-0.9922	0.32286	

Mean dependent variance	12.20887	S.D. dependent variance	15.75978
Sum squared residual	27530.97	S.E. of regression	14.28052
R-squared	0.324107	Adjusted R-squared	0.178916
F(29, 135)	2.232272	P-value(F)	0.001117
Log-likelihood	-656.2874	Akaike criterion	1372.575
Schwarz criterion	1465.753	Hannan-Quinn	1410.399
Rho	-0.191636	Durbin-Watson	2.279626

Test for differing group intercepts:
 Null hypothesis: The groups have a common intercept
 Test statistic: $F(14, 135) = 1.61043$
 with p-value $= P(F(14, 135) > 1.61043) = 0.0837735$

Wald test for joint significance of time dummies
 Asymptotic test statistic: Chi-square(10) $= 29.2715$
 with p-value $= 0.00112594$

The results of the statistical test for differing group (country) intercepts are reported above. The null hypothesis of common intercept is rejected because the F-statistics of 1.61 passes the significance test at the 10 percent confidence level. Therefore, the Fixed Effects model dominates the pooled OLS estimator, (see Appendix 2). The joint significance of time dummies is validated since the Chi-square statistic from the WALD test passes the significance test at the 1 percent level.

Note: The constant term reported in the equation above, 13.24, is the average for all 15 ECOWAS countries. Estimated values of the country intercepts (vary between 2.95 and 27.9) and are reported below:

Country Code	Country Name	Country Intercept
1	Benin	9.02
2	Burkina Faso	11.13
3	Cape Verde	7.42
4	Cote d'Ivoire	8.46
5	Gambia	2.95
6	Ghana	27.90
7	Guinea	20.31
8	Guinea Bissau	19.27
9	Liberia	14.53
10	Mali	12.35
11	Niger	8.93
12	Nigeria	23.34
13	Senegal	8.59
14	Sierra Leone	15.44
15	Togo	9.01

The econometric results obtained (reported in 5.2) show that investment, foreign direct investment and inflation exert a strong impact on economic growth in ECOWAS countries, although, the coefficient of FDI is negatively signed, contrary to expectation.

5.3   EMPIRICAL RESULTS OF A PARSIMONIOUS GROWTH EQUATION USING THE FIXED EFFECTS MODEL

In order to obtain more robust results, we dropped the insignificant explanatory variables and obtained the following results:

Model 2: Fixed-effects, using 165 observations
Included 15 cross-sectional units
Time-series length = 11
Dependent variable: gRY

	Coefficient	Std. Error	t-ratio	p-value	
Const	14.4798	4.45592	3.2496	0.00145	***
INF	-0.680772	0.322656	-2.1099	0.03669	**
gFDI	-0.00316761	0.00119615	-2.6482	0.00904	***
gINV	0.0737364	0.0343572	2.1462	0.03362	**
dt_2	13.1644	5.3441	2.4634	0.01500	**
dt_3	1.65149	5.24054	0.3151	0.75314	
dt_4	0.115135	5.23524	0.0220	0.98249	
dt_5	2.44099	5.25166	0.4648	0.64281	
dt_6	7.13436	5.25532	1.3576	0.17684	
dt_7	8.50362	5.25135	1.6193	0.10768	
dt_8	-10.2498	5.2822	-1.9404	0.05438	*
dt_9	-3.70758	5.24679	-0.7066	0.48099	
dt_10	0.686954	5.2241	0.1315	0.89557	
dt_11	-4.99143	5.24987	-0.9508	0.34339	

Mean dependent variance	12.20887	S.D. dependent variance	15.75978
Sum squared residual	27797.71	S.E. of regression	14.24440
R-squared	0.317559	Adjusted R-squared	0.183063
F(27, 137)	2.361110	P-value(F)	0.000664
Log-likelihood	-657.0828	Akaike criterion	1370.166
Schwarz criterion	1457.132	Hannan-Quinn	1405.468
Rho	-0.178668	Durbin-Watson	2.238734

Test for differing group intercepts -
 Null hypothesis: The groups have a common intercept
 Test statistic: $F(14, 137) = 1.55607$
 with p-value = $P(F(14, 137) > 1.55607) = 0.0995165$
Wald test for joint significance of time dummies
 Asymptotic test statistic: Chi-square$(10) = 29.2222$
 with p-value = 0.00114687

The results of the statistical test for differing group (country) intercepts are reported above. It can be confirmed that the null hypothesis of common intercept is rejected. The F-statistics of 1.56 passes the significance test at the 10 percent confidence level. Therefore, the use of the Fixed Effects model is justified.

Note: The value of the constant term reported in the equation above, 14.4788, is the average for all 15 ECOWAS countries. Estimated values of the country intercepts (vary from 5.51 to 29.35) and are reported below:

Country Code	Country Name	Country Intercept
1	Benin	9.99
2	Burkina Faso	12.47
3	Cape Verde	7.56
4	Cote d'Ivoire	7.94
5	Gambia	5.51
6	Ghana	29.35
7	Guinea	21.83
8	Guinea Bissau	19.70
9	Liberia	18.67
10	Mali	13.20
11	Niger	10.79
12	Nigeria	22.84
13	Senegal	9.50
14	Sierra Leone	17.85
15	Togo	9.98

The overall fit of this parsimonious representation of the empirical growth model is quite good with an R2 of 0.317. The R2 is "low" reflecting the use of growth rates in the regression analysis plus the fact that the study uses panel data. The F-statistic of 2.361 is highly significant, and passes the significance test at the 1 percent confidence level. Consequently, the hypothesis of a linear relationship between the growth rate of real GDP and the regressors in the equation cannot be rejected at the 1 percent confidence level.

The coefficient of inflation is correctly signed and negative as expected. It has a t-statistic of -2.109, with a p-value of 0.036. This value of t-statistics easily passes the significance test at the 5 percent level. Thus inflation is inversely related to growth, signifying that high levels of inflation will retard economic growth in ECOWAS countries. It necessarily follows that low inflation rates will have a positive impact on growth in these countries.

Contrary to a priori expectations, the coefficient of the growth rate of FDI has a negative sign, but it is highly significant, passing the significance test at the 1 percent level. It has a t-value of -2.648 and the p-value is 0.009. The negative sign may arise from the fact that high and volatile FDI inflows often trigger a real adjustment that is inimical to long-run economic growth, especially where FDI flows are not internalized in the economy.

The coefficient of the growth rate of investment has the expected positive sign and is highly significant. Thus, the empirical result confirms the expectation that aggregate real investment is a driver of economic growth in ECOWAS countries. The coefficient has a value of 0.0737 and its t-statistic is equal to 2.146, with a p-value of 0.033. This value of t-statistics passes the significance test at the 5 percent level. Since the regression coefficients can be interpreted as elasticities, the result obtained shows that, on the average, a 10 percent increase in aggregate real investment will trigger approximately 1 percent growth in real GDP in ECOWAS countries. To permit a deeper understanding of the variables and the relationship among them, results concerning the zero-order correlation matrix and the summary statistics are provided in Appendices 3 and 4.

6.0   CONCLUSION AND POLICY IMPLICATION

This paper has attempted to investigate the impact of inflation on economic growth in the countries of the Economic Community of West African States using data for 2001-2012 for all 15 ECOWAS member countries. The paper has relied on the unique and ground breaking econometric methodology of Fixed Effects Model to grind out the relevant impact coefficients from the panel data analysis. Economic growth was measured by the growth rate of real income and the explanatory variables

included the inflation rate, the ratio balance of payments to GDP, and the growth rates of exports, FDI and aggregate investment. Inflation was found to be significantly and negatively related to economic growth. This implies that high levels of inflation would tend to inhibit economic growth, while low rates of inflation would spur economic growth. The other key variable that had a positive and significant impact on economic growth was the growth rate of real investment. Thus, as expected, aggregate real investment emerges as an important and veritable driver of economic growth in ECOWAS countries. The growth rate of FDI was highly significant but negatively related to economic growth. The negative relationship could be attributable to the fact that high and volatile FDI inflows often trigger a real adjustment that is inimical to long-run economic growth.

In order to control the upsurge in the general price level that would militate against sustainable economic growth, improved domestic macroeconomic policy environment in terms of the consistent pursuit of appropriate monetary and fiscal policies is warranted. A stable macroeconomic policy environment would require the effective implementation of measures to reduce fiscal deficits and external debt, and to promote viable balance of payments and the maintenance of a realistic real exchange rate. In addition, the countries of ECOWAS should liberalize their FDI regimes, provide adequate legal and institutional framework to protect foreign investors, improve governance, and improve the overall investment climate. This is because efforts made in the past to control inflation have been thwarted by corruption, political instability, poor resource management, policy inconsistency, and ineffective implementation of policies. Clearly, trade liberalization and the removal of capital controls would encourage the inflow of FDI.

A major contribution of the paper to the literature on African economies is its consideration of ECOWAS countries as a unit in contrast to previous studies that focused on single countries.

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Appendices

Appendix 1: Random-effects (GLS), using 165 observations
Using Nerlove's transformation
Included 15 cross-sectional units
Time-series length = 11
Dependent variable: gRY

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	11.3134	2.78607	4.0607	0.00008	***
gINF	-0.204484	0.232044	-0.8812	0.37952	
BOPYR	-0.00234392	0.144042	-0.0163	0.98704	
gXP	0.0273469	0.0310829	0.8798	0.38029	
gFDI	-0.00186509	0.00117674	-1.5850	0.11496	
gINV	0.101813	0.0345631	2.9457	0.00371	***

Mean dependent var	12.20887	S.D. dependent var	15.75978
Sum squared resid	37820.60	S.E. of regression	15.37461
Log-likelihood	-682.4846	Akaike criterion	1376.969
Schwarz criterion	1395.605	Hannan-Quinn	1384.534

'Within' variance = 203.033
'Between' variance = 26.7332
theta used for quasi-demeaning = 0.411925
Breusch-Pagan test -
Null hypothesis: Variance of the unit-specific error = 0
Asymptotic test statistic: Chi-square(1) = 0.0478281
with p-value = 0.826887

Hausman test -
Null hypothesis: GLS estimates are consistent
Asymptotic test statistic: Chi-square(5) = 3.26006
with p-value = 0.659962

Appendix 2: 2-step dynamic panel, using 135 observations
Included 15 cross-sectional units
H-matrix as per Ox/DPD
Dependent variable: gRY
Asymptotic standard errors

	Coefficient	Std. Error	z	p-value	
gRY(-1)	0.00214286	0.121348	0.0177	0.98591	
Const	-1.56102	0.476445	-3.2764	0.00105	***
gINF	0.297927	0.45391	0.6564	0.51159	
BOPYR	0.17082	0.10252	1.6662	0.09567	*
gXP	0.0133212	0.0243595	0.5469	0.58448	
gFDI	-0.00193049	0.000301485	-6.4033	<0.00001	***
gINV	0.106851	0.0167881	6.3647	<0.00001	***

Sum squared residual	53176.55	S.E. of regression	20.38239

Number of instruments = 51
Test for AR(1) errors: z = -1.85927 [0.0630]
Test for AR(2) errors: z = -0.531996 [0.5947]
Sargan over-identification test: Chi-square(44) = 12.4619 [1.0000]
Wald (joint) test: Chi-square(6) = 17520.2 [0.0000]

Appendix 3: Correlation Matrix

Correlation coefficients, using the observations 1:01 - 15:11
5% critical value (two-tailed) = 0.1528 for n = 165

gRY	INF	BOPYR	gXP	gFDI	
1.0000	0.0090	-0.0085	0.0708	-0.1684	gRY
	1.0000	-0.0854	0.0255	0.0817	INF
		1.0000	-0.0160	-0.1294	BOPYR
			1.0000	-0.1144	gXP
				1.0000	gFDI

gINV	
0.2351	gRY
0.1985	INF
-0.2104	BOPYR
0.0485	gXP
-0.1524	gFDI
1.0000	gINV

Appendix 4: Summary Statistics, using the observations 1:01 - 15:11

Variable	Mean	Median	Minimum	Maximum
gRY	12.2089	11.5378	-23.6940	133.393
INF	6.77735	4.68439	-3.50259	34.6953
BOPYR	-7.71499	-6.94422	-56.8208	25.3348
gXP	18.7717	13.4182	-47.0133	382.999
gFDI	145.948	7.20368	-395.245	13193.6
gINV	19.8613	11.6798	-55.5622	187.693

Variable	Std. Dev.	C.V.	Skewness	Ex. kurtosis
gRY	15.7598	1.29085	3.36848	23.1255
INF	6.91432	1.02021	1.39567	2.28483
BOPYR	10.3760	1.34491	-1.29997	5.19554
gXP	38.7197	2.06266	5.45999	47.0255
gFDI	1048.12	7.18146	11.8326	144.372
gINV	36.2685	1.82609	2.24622	7.09441

Variable	5% Perc.	95% Perc.	IQ range	Missing obs.
gRY	-7.11238	30.3036	12.5226	0.000000
INF	-0.962990	18.9907	8.95582	0.000000
BOPYR	-28.6771	6.74293	8.85943	0.000000
gXP	-21.2508	66.0804	24.0393	0.000000
gFDI	-80.5563	548.245	91.4927	0.000000
gINV	-21.2014	88.8256	23.3563	0.000000

PUBLIC DEBT AND ECONOMIC GROWTH: EVIDENCE FROM NIGERIA'S DATA

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ABSTRACT

The study seeks to investigate the relationship between public debt and economic growth in Nigeria from 1986 to 2010. The choice of the period is to cover SAP era (1986-1988/90), the post SAP era (1991-1998), the period of guided deregulation (1994-1997) and democratic governance (1999-2010) including the debt exit deal of 2005 in order to accommodate major macroeconomic reforms and policy changes. Using econometric method, the study examines the impacts of public debt on economic growth in Nigeria by applying the ordinary least square technique on a system of multiple regression equations. Based on the econometric analysis, the study reckons that public debt has made insignificant impact on Nigeria's economic growth in the review period. Since the impact of external debt on economic growth in Nigeria is adjudged insignificant, it entails trivial impact on the real economy. Having critically reviewed conceptual and theoretical issues, the study deduced that corruption has inhibited the utilisation of public debt, thereby culminating in unwarranted debt burdens, increased poverty and augmented underdevelopment in Nigeria. The paper recommends that borrowed funds should henceforth be properly utilised by investing in development schemes, infrastructural projects, human capital as well as research and development (R&D).This would translate into increase in industrial and technological development with positive consequences on investment, employment, income, output, export expansion, government revenue, and sustained economic growth. Government should maintain a debt-bank deposit ratio of not more than 30 percent and should resort to increased use of tax revenue to finance its projects since tax revenue collection is far from the optimum level in Nigeria, amongst other recommendations.

Key Words: Public Debt, Economic Growth, Debt Service, Export, Nigeria

1.1 INTRODUCTION

The macroeconomic management of every economy is aimed at achieving sustainable level of economic growth and development. Public debt (external and domestic) management is one of such tools used in managing the economy. Managing the economy requires capital goods, raw materials and technical know-how. But adequate resources are hardly available to finance such

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[4] *The views expressed in the paper are those of the author and do not represent those of the University of Jos. The paper has benefited tremendously from the comments by Mr. Sam Omoruyi, Debt Advisor, West African Institute for Financial and Economic Management (WAIFEM).*

investments. There is thus a wide gap between available domestic resources or savings and the investments to be undertaken. The gap in developing countries, including Nigeria reflects the prevalence of low productivity, inadequate technology, low tax effort, meagre foreign exchange earnings resulting from weak terms of trade, among other factors. Although borrowing in itself is not a desirable but a necessary option, these countries resort to it in order to accelerate the rate of economic growth and development.

Public debt, including external finance to low-income economies is meant to supplement and support developing countries' domestic resource mobilization. However, since the nineteenth century, developing countries have experienced repeated episodes of rapidly increasing public indebtedness and debt-service burdens that have brought slower growth or recession and eventually provoked renegotiation and restructuring of public debt especially the external debt component.

The objectives of the paper are to examine the impacts of public debt on economic growth in Nigeria; identify the problems of public debt utilisation in the country, and proffer policy recommendations that would address them. For purpose of easy exposition, the study is divided into six parts. Following the introductory aspect of the paper is Part two which is concerned with review of relevant literature and theoretical framework. Part three attempts an analysis of trends of public debt in Nigeria, while Part four describes the methodology of the study. Whereas part five discusses the regression results and the findings of the work, part six concludes with recommendations.

2.1   REVIEW OF LITERATURE AND RELATED THEORIES

2.1.1   EMPIRICAL REVIEW
Checcherita and Rother (2010) determine the average impact of government debt on per capita GDP growth in twelve euro area countries over a period of about 40 years from 1970 to 2009. The authors hold that the channels through which government debt impacts on growth are private savings, public investment, total factor productivity and real interest rates. The study shows non-linear negative impact of government debt on economic growth in some of these countries while government debt positively affects economic growth in the others. Schclarek (2004) examines the relationship between gross government debt and per capita GDP growth in developed countries. The results of the effort indicate that there is no strong evidence of a statistically significant relationship between gross government debt and per capita GDP growth for a sample of 24 industrial countries in the period 1970 through 2002. Similarly, Panizza and Andrea (2013) examine public debt and

economic growth in advanced countries using econometric methods. The study reveals a negative correlation between debt and growth in developed countries. They conclude that there is non-monotonic relationship between debt and growth since the result exhibits cross-country heterogeneity.

Fry (1997) studies the impact of alternative deficit financing strategies on economic growth in sixty six low-income countries and emerging markets in the period 1979-1993. The study shows that market based domestic debt issuance is the least cost method of financing the budget deficit compared with external borrowing and seigniorage. All of these methods reduce growth, domestic savings and increase inflation. Similarly, Abbas and Christensen (2007) highlight the impact of domestic debt on economic growth in ninety three low-income countries over the period 1975-2004 by applying Granger Causality regression model. The analysis shows that moderate levels of marketable domestic debt as a percentage of GDP have significant positive, non-linear impact on economic growth, but debt levels exceeding thirty five percent of total bank deposits have negative impact.

Maana et al (2008) analyze the impact of domestic debt on Kenya's economy. The authors examine the impacts of domestic debt on private sector lending by applying ordinary least square technique using annual data over the period 1996 to 2007. The study finds that domestic debt does not crowd out private sector lending in Kenya during the period, reflecting substantial level of financial development in Kenya. The study also examines the effects of domestic debt on real output by using a modified Barro growth regression model. The results indicate that increase in domestic debt has a positive but insignificant effect on economic growth during the period. The study suggests that government should put in place wider reforms that promote investment in treasury bonds and encourage institutional investors.

Tajudeen (2012) examines the causal nexus between public debt and economic growth in Nigeria between 1970 and 2010 using a Vector Autoregressive (VAR) technique. The variables used in the study were tested for stationarity using the Augmented Dickey Fuller and Philip Perron tests. The result shows that the variables are stationary at first differencing. Co-integration test was also performed and the result revealed the presence of co-integration between public debt and economic growth in Nigeria in the sample period. It implies that public debt and economic growth have long run relationship. The findings of the VAR model reveal that there is a bi-directional causality between public debt and economic growth in Nigeria. The paper concludes that public debt and economic growth are positively related but its poor utilisation has inhibited the country's economic performance.

Uzochukwu (2003) investigates the quantitative effects of public debt and economic growth on poverty in Nigeria by applying the per-capita income approach using annual data of 1970 to 2002. The study uses growth and debt variables and suggests that these variables have played very vital role towards poverty acceleration in Nigeria. Ajayi and Oke (2012) investigate the effect of public debt burden on economic growth and development in Nigeria. They use regression analysis based on OLS to indicate that debt burden had an adverse effect on national income and per capita income in the country. They conclude that external debt has led to devaluation of the nation's currency, increase in retrenchment of workers, continuous industrial strike and poor educational system, thereby making Nigeria a depressed economy. Based on the findings, the study suggests that debt service obligation should not be allowed to exceed foreign exchange earnings and that loans contracted should be invested in profitable ventures in order to generate a reasonable amount of money for debt repayment.

The above review indicates the existence of various studies on the linkage between debt and growth in various countries of the world - developed and developing economies. It implies that the relevance of debt and growth to global and national development of countries cannot be ignored. While one of the literature studies explains the causal relationship between public debt and growth in Nigeria, a few others have examined the impact of either external debt on growth or domestic debt on growth and poverty in Nigeria. The focus on external debt or domestic debt rather than public debt (external plus domestic) could be misleading since the authorities could not really hold domestic debt impact constant during analysis in these studies. This study believes that much more meaningful results would emerge where the focus is on public debt rather than the external or domestic debt component alone since it is difficult to disentangle the separate impacts of external and domestic debt on economic growth. It implies that related studies on public debt and growth in Nigeria are few and far between. The paper therefore seeks to contribute by filling this knowledge gap. The study would also introduce a unique and new methodological approach in its model specification. This involves the use of two dependent variables in different equations settings to provide corroborative evidence of the research findings.

2.1.2   RESOURCE AND DUAL GAP THEORY

Early development economists and external debt apologists such as Singer (1949) Lewis (1954) Domar (1957) Kindleberger (1965) Pearson (1969) World Bank (1988) and Ogwuma (1995) theorise that external debt or external capital can stimulate economic growth especially in developing countries. They argue that the transfer of foreign resources to less developed countries which are characterised by low or zero-growth rate, will help in transforming these economies into ones that are capable of adequate and sustainable growth. This means that the demand for

foreign resources in developing countries is necessary and serves to supplement domestic resource gaps with positive effects on growth.

The dual gap theory has formed the theoretical foundation on which various scholars stand to explain the subject of external debt. This theory is a postulation of the Keynesian proposition. The dual gap analysis explains that development is a function of investment and that such investment which requires domestic savings is not sufficient to ensure that development take place. There is the possibility of obtaining from abroad the amount that can be invested in any country to be identical with the amount that is saved. Furthermore, if the domestic resources are to be supplemented from abroad, such as excess of import over export i.e. M > X, it means that investment is greater than savings (I – S) or imports exceed exports (M – X). This can be presented as I – S = M – X. This implies that debt arises where imports exceed exports. It also means that where exports fully compensate for imports (X - M = 0), then there is no debt. (Klein, 1994). In national income accounting, an excess of investment over domestic savings is equivalent to excess surplus of import over export. This could be explained as written in equation form below:

Income = consumption + import + savings

Output = consumption + export + investment

Income = output, and

Investment – Saving = Import – Export

Therefore, debt is a financing item to meet the investment gap and government deficit gap (M – X) = (I – S) + (G – T) derived as a reconciliation of the two approaches to measuring aggregate demand, the expenditure and income measures. (Klein, 1994). This is the basis of dual gap analysis as it assures that there is a country that requires saving and investment (more imports than exports equals foreign debt) to achieve a particular rate of growth. If the available domestic saving falls short of the level necessary to achieve the target rate of growth, a savings investment gap is said to exist. On a similar note, if the maximum import requirement needed to achieve the growth target is greater than the maximum possible level of export, then there is an exchange gap of export-import origin.

2.1.3   DEBT OVERHANG THEORY

The concept of debt overhang has been applied to sovereign governments, predominantly in developing countries (Krugman, 1988). It describes a situation where the debt of a country exceeds its future capacity to pay back the debt. This occurs if there is a latent output gap or underemployment in an economy, which is bridged repeatedly by credit creation, the buildup of which results in a debt overhang. Similar view was expressed by Corden (1989) who theorises that the negative effect of debt overhang derives from a lack of motivation on the part of governments to implement economic stabilization and policy reforms, in the

expectation that any revenues generated by an improvement in the domestic economy will go entirely to debt servicing.

The analysis of the debt overhang theory could be linked to investment and economic growth. A debt overhang is thus a situation of a debtor country where the outstanding debt is so large and rising as a proportion of Gross Domestic Product, say over 80 to 90 per cent, that investment will be inefficiently low and growth inhibiting without new money or debt and debt service reduction. This implies that the accumulated debt acts as a tax on future output, discouraging productive investment by the private sector, and inhibiting growth. This is because increase in the production or exports of the indebted country generates revenues that must be used to repay current debt obligations; that is, creditors receive a significant portion of the future returns on investment (Bahram and Williams et al 1981). It is clear that rapid economic growth cannot be achieved in countries with debt overhang problem.

Nevertheless, empirical evidence on debt overhang hypothesis has been rather mixed, but many of the studies find debt variables to be significantly and negatively correlated with investment or growth. For instance, Borensztein (1990) using data for the Philippines find that the debt overhang hypothesis was largely valid. Desphande (1997) obtains similar result from his study of the experience of 13 severely indebted countries. Green and Villanueva (1991) also find evidence of the debt overhang hypothesis for 23 developing countries as Elbadawi (1996) confirms it for 99 developing countries.

However, Cohen (1993) rejects the debt overhang theory, arguing instead, that debt service payments crowd out investment by government. Warner (1992) arrives at a similar conclusion and corroborates the result obtained by Cohen in his study of 13 heavily indebted countries. Similar results were corroborated by Degefe (1992) in Ethiopia. Generally, empirical studies on the subject are not conclusive. A good deal of the empirical literature on the relationship between public debt overhang and economic growth and investment shows negative effects. The studies that have shown favourable effects of external debt are rare. They include World Bank (1988) study in the period 1980-1986 and Chowdbury (1994) for Bangladesh, Indonesia and South America as observed by Ajab and Audu (2006).

3.1   SYNOPSIS OF PUBLIC DEBT IN NIGERIA

3.1.1   PROFILE OF DOMESTIC DEBT IN NIGERIA
In Nigeria, treasury bills constitute the main component of domestic debt accounting for 77.4 percent of total domestic debt in 1960, declined to 51 percent

by 1970 but rose to 62 percent in 2003. The decline in the percentage share of treasury bills in the mid 1970s reflected the burst of revenue from the oil sector. The growth in the volume of treasury bills also reflected the practice of rollover of matured securities and continuous recourse to conversion of ways and means advances outstanding at the end of the year to treasury bills as a way of funding the fiscal deficits. Treasury certificates, which were first issued in 1968, constituted one of the largest securities between 1983 and in 1995, when the Federal Government of Nigeria decided to further reduce the debt service obligations on domestic debt. A treasury certificate was therefore abolished in 1996. In 1989, the monetary authorities at the inception of the action bid system floated treasury bonds as another instrument in the portfolio of domestic debt.

The objective was to minimize the service obligation on domestic debt arising from the liberalization policies. Thus in 1989, ₦20 million worth of treasury bills representing 58.6% of treasury bills outstanding were converted to treasury bonds. Development stocks were apparently the first government instruments to be issued. It floated largely to provide development finance either directly to meet the needs of the federal government or as loan on lent to the state government. The development stocks were first registered debt stocks in 1956/61. The stock outstanding increased in 1960, 1987 and 1988. This stock is traded in the secondary market of the Nigeria Stock Exchange.

It was in 1986, at the inception of the Structural Adjustment Programme (SAP) that the level of external debt for the first time became larger than the level of domestic debt. Since then, the stock of external debt has consistently been larger than domestic debt until 2005. Alison et al (2003), gives three theoretical reasons often advanced for government domestic debts. The first is for budget deficit financing, the second is for implementing monetary policy (buying and selling of treasury bills in the open market operation) and the third is to develop the financial instruments so as to deepen the financial markets. In Nigeria, several factors have been advanced to explain the changing domestic debt profile between 1986 and 2012. The major factors responsible for the rising domestic debt in Nigeria are high budget deficits, low output level (low output growth), increased government expenditures (large expenditure growth), high inflation rate and narrow revenue base witnessed in the early and mid1980s. Other causative factors include the collapse of international oil price in 1981 as domestic lapses and a faulty domestic policy which ranges from project financing mismatch, inappropriate monetary and fiscal policies were responsible for mounting domestic debt problem. Output growth declined as it recorded annual average values of 5.9% in 1980-1984, 4% in 1990–1994 and 2.8% in 1998–1999 periods respectively.

However, growth was recorded in 2003. It is usually expected that as countries expand their output, they also tend to rely more heavily on domestic public debt issuance to finance growth. There is thus a strong cross-country relationship between economic growth and the total size of the debt market. Public expenditure as a percentage of GDP increased from 13% in the 1980 – 1989 periods to 29.7% in the 1990 –1994 periods. This increased public expenditures to GDP ratio resulted from fiscal policy expansion embarked upon during the oil boom era of the 1970s. Nevertheless, as the oil boom declined in the 1980s, priorities of government expenditure did not change. Consequently, the fiscal operations of the federal government resulted in large deficits from the average of 0.8% of GDP in the 1970-1979 period, the level of deficit increased persistently averaging 5.1% in 1980-1989 and 10.0% in 1990-1994. A very remarkable feature of the government fiscal expansion was the financing of the excess expenditures from domestic sources averaging 79.2% between 1980 and 2002, since foreign loan was difficult to obtain. Cross-country relationship between fiscal deficits (as percentage of GDP) and the size of government debt markets confirms that countries with larger fiscal deficits tend to experience slower growth. This point was corroborated by a former CBN Governor (Joseph Sanusi) who observes that one major problem that has hindered the attainment of macroeconomic stability and sustainable growth has been the excessive reliance by the Federal Government of Nigeria on borrowing from the banking system, particularly the CBN, to finance its large and unsustainable fiscal deficits (Sanusi, 2003).

Trend in Nigeria's domestic debt indicates that total domestic debt was ₦28, 440.2 million in 1986 but, rose to ₦36, 790.6 million in 1987, showing an increase of ₦8, 350.4 million between the two periods. Similarly, in 1990, domestic debt increased to N84, 093.1 million from ₦47, 031.1 million in 1988, showing an increase in ₦37, 062.0 million between the two periods. It is pertinent to note that the increase in domestic debt between 1989 and 1990 is greater than that in the period 1986 and 1987 by N28, 711.6 million. The reason for this increase is that more money was needed by the government to finance its deficit budget. In 1996, domestic debt outstanding rose astronomically to ₦343, 674.1 million, increasing by almost five-fold from N84, 093.1 million in 1990. By 2000 domestic debt had grown to N898, 253.9 million showing an increase of ₦554, 579.8 million between 1996 and 2000. The high rate of domestic debt continues unabated till 2004 to ₦1, 016, 994.0 million, ₦1, 166,000.7 million, ₦1, 329,692.7 million and ₦1, 370,325.2 million in 2001, 2002, 2003 and 2004, respectively. In absolute terms, Nigeria's domestic debt had sky-rocketed over the decades with the effect that her domestic debt consumes a larger chunk of her Gross Domestic Product (GDP).

The domestic debt stock outstanding as at 31st December 2004 amounted to ₦1, 370.32 billion, compared with ₦1, 329.72 billion as at December 31st 2003. This figure

represents an increase of ₦40.63 billion or 3.1 percent over the previous year's figure. This is the lowest annual growth in the domestic debt stock for eight years: growth averaged 22 percent per year over 1997-2003, and peaked at fifty percent growth in 1998. Between 1995 and 2003, domestic debt increased more than fourfold. The increase of ₦40.63 billion in the domestic debt stock was made up of new issues of Treasury Bills valued at ₦46. 52 billion, which was partly offset by repayments of Treasury Bonds and FGN Development Stocks valued at ₦5.67 billion and ₦0.22 billion respectively. As at the previous year (2003), the Treasury Bills remained the dominant instrument, accounting for ₦871.57 billion or 64 percent of the total domestic debt stock. The balance of the total domestic debt stock was made up of Treasury Bonds (₦424.94 billion or 31 percent), Federal Republic of Nigeria Government Development Stock (₦1.25 billion or 0.1 percent) and the 1st FGN Bonds was N72.56 billion or 5.3 percent (Gabriel, 2013).

Detailed report of the domestic debts shows that the Federal Government bonds accounted for ₦3.71 trillion or 60.37 per cent of the money borrowed from internal sources as at June ending 2012. Of course, the Nigerian treasury bills accounted for ₦2.08 trillion or 33.88 per cent, while Treasury bonds accounted for ₦353 billion or 5.75 per cent. Similarly, the domestic debt component of the total debt profile as at March 31, 2012 which stood at ₦5.966 trillion shows that the Federal Government bonds accounted for ₦3.67 trillion or 61.44 per cent of the money borrowed through internal sources. Whatever the likely benefits derivable from the huge internal borrowing, it is bound to have negative economic consequences on the citizens (Wakili, 2013).

Nigeria's domestic debt profile is rising at unprecedented rate, and even more drastically in recent time, as the nation faces persistent security challenges as efforts by government had failed to reduce the nation's debt profile. For example, statistics obtained from the Debt Management Office indicate that the domestic debts had increased from ₦5.966 trillion ($37.71 billion) at the end of the first quarter ended March 31, 2012, to ₦6.153 trillion ($38.89 billion) at the end of the second quarter ended June 30, 2012. Indeed, the figures represent an increase of ₦187 billion or three per cent over the figure recorded in the first quarter (Onike, 2012). Considering the economic implications of the nation's rising debt profile, it becomes a major policy issue requiring extensive public debates and discourse. More importantly, huge indebtedness of the nation remains one of the major challenges facing most developing countries at the beginning of the 21st Century. Indeed, high levels of domestic national debt are likely to be deleterious to economic growth and development. It is also true that any economy structured and sustained by borrowing cannot achieve economic prosperity.

The recent acknowledgement and lamentation by President Goodluck Jonathan

while presenting the 2012 budget proposal to the National Assembly that the country's domestic debts have been growing at alarming rates in recent years is a further testimony to the nation's economic instability. It is also worthy of note the decision of the federal government to earmark ₦560 billion for debt servicing in the 2012 budget, and debt servicing cost of public debt is likely to crowd out public investment. It may also be deduced from President Goodluck Jonathan's admission of the threats posed on the nation by the high domestic debt profile that the explosive growth of domestic debt has called for serious national rethink.

3.1.2   TRENDS IN NIGERIA'S EXTERNAL DEBT

In absolute terms, the total external debt stock rose from a meagre US$567 million in 1970 to US$5,091 million in 1978. Between 1979 and 1985, it increased further from US$6,216 million to US$18,904.0 million. It stood at US$25,574.0 million in 1986, and peaked at US$33,730.0 million in 1991. Thus, between 1985 and 1991, the debt stock increased by US$14,826.0 million or 78.4 per cent in just six years. During this period, the increase has been astronomical reflecting the indiscriminate resort to external borrowing ostensibly to finance projects coupled with the crash in international oil price in 1982 (World Bank, 2003). With the debt buy-back arrangement and the issuance of collateralized par bonds to the London Club of creditors in 1992, the debt stock dropped from US$33,730.0 million in 1991 to US$27,564.0 million in 1992. This had changed in a significant way the structure of Nigeria's external debt.

However, by 1993, 1994 and 1995 the debt stock trended upward to US$28,718.2, US$29,428.9 and US$32,584.8 million, respectively to finance the expansion in fiscal deficit. The debt stock then dropped to US$28,060.0 and US$27,087.8 million in 1996 and 1997, respectively. This was mainly because new loans were not contracted after the reconciliation exercise conducted in 1995 to ascertain the genuineness of some external claims. Conversely, by 2003 and 2004, it had moved upward again, recording a total outstanding balance of US$32,916.8 million and US$35,944.6 million respectively. Nigeria's external debt stock has witnessed changes, both in structure and quantum. Over the years, the classification of Nigeria's debt by source as at the end of December 2004 showed that $30.8 billion or 86.0 per cent is owed to the Paris Club of Creditors while indebtedness to multilateral sources amounted to $2.8 billion or 8.0 per cent. Outstanding Promissory notes constitute 2.0 per cent or $0.7 billion. Debt obligations to the London Club amounted to $1.4 billion or 4.0 per cent. Other bilateral (non-Paris Club) accounted for the balance of $47.5 million. Paris Club is the main source of Nigeria external debt and the most problematic of all the sources. The debt continued to rise due to accumulation of payment arrears and default in interest payments. The arrears and interest are capitalized and added to the debt stock, further aggravating the debt burden until 2005 when Nigeria experienced

debt forgiveness and relief.

4.0   METHODOLOGY, DATA SOURCES AND METHOD OF DATA ANALYSIS

The study utilises secondary literature, which was obtained from journals, textbooks, official government publications and reports from international organisations, newspapers and magazines, internet websites and other documentary sources. Secondary data obtained from the Central Bank of Nigeria (CBN), Debt Management Office (DMO), and African Development Indicators of the World Bank were used for the study. Time series data covering a period of 25 years (1986-2010) were adopted. The period was deliberately chosen to correspond with major external borrowings and reforms in Nigeria. The choice of the period is to cover SAP era (1986-1988/90), the post SAP era (1991-1998), the period of guided deregulation (1994-1997) and democratic governance (1999-2010) including the debt exit deal of 2005. To accommodate reforms and policy changes in the parameter shift over the period of study, SAP dummy (Dsap) and democracy dummy (Demo) have featured in the equations.

The study employs a macro-econometric method of analysis where the ordinary least square (OLS) technique was used in the regression equations to estimate the parameters of the regressors. The data used were in ratios and percentages. There was need for the data to undergo unit roots and co-integration tests since the data are time series in nature. The Augmented Dicker-Fuller unit root test was used; to emphasise and validate the stationarity or non-stationarity of the time series data (in ratios) used for this study, and to show whether the variables are cointegrated. The test for unit root is to avoid a spurious regression model, which may produce unrealistic results. The study has used ratios of public debt to exports, public debt to GDP, public debt to government revenues and public debt service to GDP and exports in separate equations in order to avoid multicollinearity problem in the course of data estimation and analysis. The regression analyses are based on public debt data series in Nigeria.

4.1   MODEL SPECIFICATION

The study would uniquely use regression results with change in gross fixed capital formation as the dependent variable as corroborating evidence to results from regression with percentage change in GDP as the dependent variable. It implies that percentage change in GDP or annual GDP growth rate is adopted in this study as proxy for economic growth. Investment is used as independent variable in some equation settings because the link between investment and growth is such that Gross Fixed Capital Formation (GFCF) drives income and output growth. Note that debt can be represented not only in terms of stock but also in terms of flows, that is, debt service. It implies that the ratio of public debt to GDP, ratio of public debt to

exports, ratio of public debt to government revenues, and ratio of public debt service to exports would be used as the regressors in different equations settings to avoid the multicollinearity problem as earlier mentioned. First, considering the influence of public debt to exports ratio on growth (proxied by % change in GDP), we formulate the following model specification to enable the use of common denominator for reliable outcome over time trend:

$$?GDP_t = a_0 + ?a_1 DOD/EXP_t + ?a2ExtR/GDP_t + ?a3TGE/GDP_t + a4Dsap_t + a5Demo_t + \mu_1$$
... (1)

Where;   ?GDP = percentage change in GDP (proxy for economic growth)

                DOD/EXP = ratio of public debt outstanding to Exports

                ExtR/GDP = ratio of external reserve to GDP

                TGE/GDP = total government expenditure to GDP ratio

                Dsap = SAP dummy

                Demo = democracy dummy

                a_0 = intercept constant

                a_1, a_2, a_3, a_4 and a_5 are estimating parameters of equation (1)

                (such that $a_2, a_3, a_4, a_5 > 0, a_1 < 0$)

                t = time trend (stage of development)

                μ_1 = error term

Incorporating public debt/GDP ratio, financial deepening (money supply to GDP ratio), and overall budget deficit/GDP ratio we arrive at equation two (2) below:

$$?GDP_t = {}_o + ?{}_1 DOD/GDP_t + ? 2M_2/GDP_t + ? 3InflR_t + 4Dsap_t + 5Demo_t + \mu_2$$
... (2)

Where;   ?GDP = is as previously defined in equation 1

                DOD/GDP = ratio of public debt outstanding to GDP

                M2/GDP = financial deepening (money supply/GDP ratio)

                InflR = inflation rate as a measure of macroeconomic stability

                Dsap, Demo, and t = are as previously defined

                 ${}_o$ = intercept constant

                 ${}_1, {}_2, {}_3, {}_4$ and ${}_5$ are the estimating parameters of equation (2)

                (such that ${}_1, {}_2, {}_4, {}_5 > 0, {}_3 < 0$)

                μ_2 = the error term

There is need to account for public debt to government revenue ratio. This leads us to equation three (3) below which incorporates the overall budget deficit and foreign remittances:

$$?GDP_t = c_o + ?c_1 DOD/REV_t + ?c2FREM/GDP_t + ?c3BD/GDP_t + c4Dsap_t + c5Demo_t + \mu_3$$

... (3)

Where; $?GDP$ = is as previously defined in equation 1

DOD/REV = ratio of public debt outstanding to government revenue

FREM/GDP = foreign remittances to GDP

BD/GDP = overall budget deficit (budget deficit/GDP ratio)

Dsap, Demo, and t = are as previously defined

co = intercept constant

c_1, c_2, c_3, c_4 and c_5 are the estimating parameters of equation (3)

(such that $c_1, c_2, c3, c_4, c_5 > 0, c_1 < 0$)

μ_3 = error term

To incorporate the debt service component of public debt, we introduce a fourth model as specified in equation four (4) below:

$$?GDP_t = d_o + ?d_1 DS/EXP_t + ?d_2 FDI/GDP_t + ?d_3 ExchRT_t + d_4 Dsap_t + d_5 Demo_t + \mu_4 \quad ... (4)$$

Where; $?GDP$ = is as previously defined in equation 1

DS/GDP = public debt servicing to GDP ratio

FDI/GDP = ratio of foreign direct investment to GDP

ExchRT = Exchange rate as a determinant of trade

Dsap, Demo, and t are as previously defined

d_o = intercept constant

d_1, d_2, d_3, d_4 and d_5 are the estimating parameters of equation (4)

(such that $d_2, d_3, d_4, d_5 > 0, d_1, < 0$)

μ_4 = error term

First, considering the influence of public debt to exports ratio where GFCF is used as the dependent variable, we formulate the fifth model specification in log linear form to reflect percentage change in gross fixed capital formation over time trend:

$$?GFCF_t = a_0 + ?a_1 DOD/EXP_t + ?a_2 ExtR/GDP_t + ?a_3 TGE/GDP_t + a_4 Dsap_t + a_5 Demo_t + \mu_5 \quad ...$$
(5)

Where;   GFCF = gross fixed capital formation (Dependent variable)

DOD/EXP = ratio of public debt outstanding to Exports

ExtR/GDP = ratio of external reserve to GDP

TGE/GDP = total government expenditure to GDP ratio

Dsap = SAP dummy

Demo = democracy dummy

a_0 = intercept constant

a_1, a_2, a_3, a_4 and a_5 are estimating parameters of equation (5)

(such that $a_2, a_3, a_4, a_5 > 0, a_1 < 0$)

t = time trend (stage of development)

μ_5 = error term

When debt/GDP ratio, financial deepening (money supply to GDP ratio), and

overall budget deficit/GDP ratios are regressors against changes in gross fixed capital formation, we arrive at equation two (6) below:

$$?GFCF_t = {}_o + ?{}_1DOD/GDP_t + ?{}_2M_2/GDPt + ?{}_3InflR_t + {}_4Dsap_t + {}_5Demo_t + \mu_6 \quad ...(6)$$

Where;   GFCF = is as previously defined in equation 5
         DOD/GDP = ratio of public debt outstanding to GDP
         M2/GDP = financial deepening (money supply/GDP ratio)
         InflR = inflation rate as a measure of macroeconomic stability
         Dsap, Demo, and t = are as previously defined
         $_o$ = intercept constant
         $_1, _2, _3, _4$ and $_5$ are the estimating parameters of equation (6)
         (such that $_1, _2, _3, _4, _5 > 0, _1 < 0$)
         μ_6 = the error term

There is need to account for outstanding debt to revenue ratio in relation to change in gross fixed capital formation. This leads us to equation seven (7) hereunder which incorporates the overall budget deficit and foreign remittances:

$$?GFCF = c_o + ?c_1DOD/REV_t + ?c_2FREM/GDP_t + ?c_3BD/GDP_t + c_4Dsap_t + c_5Demo_t + \mu_7 \quad ...(7)$$

Where;   GFCF = is as previously defined in equation 5
         DOD/REV = ratio of public debt outstanding to government revenue
         FREM/GDP = foreign remittances to GDP
         BD/GDP = overall budget deficit (budget deficit/GDP ratio)
         Dsap, Demo, and t = are as previously defined
         c_o = intercept constant
         c_1, c_2, c_3, c_4 and c_5 are the estimating parameters of equation (7)
         (such that $c_1, c_2, c_3, c_4, c_5 > 0$)
         μ_7 = error term

To incorporate the debt service component of public debt, the ratio of FDI to GDP as well as exchange rate as regressors against changes in gross fixed capital formation, we introduce the eighth model as specified in equation eight (8) below:

$$?GFCF_t = d_o + ?d_1DS/EXP_t + ?d_2FDI/GDP_t + ?d_3ExchRT_t + d_4Dsap_t + d_5Demo_t + \mu_8 \quad ...(8)$$

Where;   GFCF = is as previously defined in equation 5
         DS/GDP = public debt servicing to GDP ratio
         FDI/GDP = ratio of foreign direct investment to GDP
         ExchRT = Exchange rate as a determinant of trade
         Dsap, Demo, and t are as previously defined
         d_o = intercept constant
         d_1, d_2, d_3, d_4 and d_5 are the estimating parameters of equation (8)

(such that d_2, d_3, d_4, $d_5 > 0$, d_1, < 0)

μ_8 = error term

To ascertain the impacts of total domestic debt and total external debt on growth during the period of study, we use equation (9) below:

$$GDP_t = a_o + a_1 TDD_t + a2TED_t + \mu_9 \qquad \qquad \dots \text{ (9)}$$

Where;   GDP = is gross domestic product (output growth)

TDD = total domestic debt in Nigeria

TED = total external debt in Nigeria

a_o = intercept constant

a_1 and a_2 are the estimating parameters of equation (9)

(such that $a_2 > 0$, $a_1 < 0$)

μ_9 = error term

To provide a dynamic analysis of impact of public debt on growth, regressions would also be run in order to test for debt overhang by adopting three sets of data in time perspective: 1970-1985; 1986-2004; 1970-2010. The expectation is that the results obtained from the three data sets would assist in drawing reasonable conclusions as to the overall impacts of public debt on economic growth using a multiple regression equation (10) as follows:

$$GDP_t = z_o + z_1 PubDebt_t + z2FDI_t + z3FREM_t + \mu_{10} \qquad \qquad \dots \text{ (10)}$$

Where;   GDP = is as previously defined in equation (9)

PubDebt = total public debt in Nigeria for the period under review

z_o = intercept constant

z_1, z_2, z_3, = are the estimating parameters of equation (10)

(such that z_2, $z_3 > 0$, and $z_1 < 0$)

μ_{10} = error term

Tables 1, 2, 3, 4, 5 and 6 in the appendix area give the ratios of public debt and growth data in Nigeria as well as raw data on public debt and GDP, foreign remittances, FDI, etc. used to investigate the subject of study.

Pre-analysis test for unit root and autocorrelation were conducted. Augmented Dickey Fuller (ADF) was used to ascertain the stationary state of the data in order to avoid spurious regressions and to ensure that the variables are cointegrated in the long-run. Two or more variables are said to be cointegrated if they exhibit a long run equilibrium relationship, though in the short run, they may drift apart (Engle and Granger, 1987). It implies that the variables under study are expected to be stationary over a long term to enable reliable conclusions. Autocorrelation indicates the correlation between members of series of observations ordered in time that are lagged in a given series with itself lagged by a number of time units as successive observations are likely to be independent. This should be tested because in the

presence of autocorrelation, the t-test and F-test of significance are no longer valid, and if applied are likely to give misleading conclusions about the statistical significance of the estimated regression coefficients. This means that autocorrelation test is very necessary to avoid making inferences with unreliable results. Heteroscedasticity would show if the variances of the error terms are constant or are homoscedastic.

4.2   DEFINITION AND THE RATIONALE FOR THE CHOICE OF VARIABLES AND A PRIORI EXPECTATION

The rationale for the choice of variables of study used in the estimation model to enable the achievement of the objective of the paper is explained hereunder:

Percentage change in GDP (Annual GDP Growth Rate)
This is a measure of economic growth from one period to another expressed as a percentage and adjusted for inflation (i.e. expressed in real as opposed to nominal terms). The real economic growth rate is a measure of the rate of change that a nation's gross domestic product (GDP) experiences from one year to another. Gross national product (GNP) can also be used if a nation's economy is heavily dependent on foreign earnings. The GDP growth rate is the most important indicator of economic health. When the economy is expanding, the GDP growth rate is positive. If it's growing, so will business, jobs and personal income.

Public debt to export ratio
Measured as a ratio of debt to exports, export is a function of international trade where goods produced in one country are shipped to another country for future sale or trade. The sale of such goods adds to the producing nation's gross output. If used for trade, exports are exchanged for other products or services. Where imports exceed exports, the economy will run into debt in order to finance the gap. The implication is that future export revenues that would be used in debt settlement would constitute a drain on the economy. We therefore expect that the ratio of debt to export in a country that relies on primary exports would impact negatively on growth if more proportion of export revenues are used in debt settlement.

External reserve to GDP ratio
This refers to holdings of foreign currency held by a government. A substantial foreign reserve of consistently stable currencies, such as a reserve currency like the dollar or the Euro, can dampen the effect of inflation or of a currency crisis. External Reserves are variously called International Reserves, currency reserve or Foreign Reserves or Foreign Exchange Reserves. Since external reserve is used to finance trade activities and related payment balances, it is expected to positively drive investment and growth in Nigeria.

Government expenditure to GDP ratio

This variable is appropriately measured as the ratio of government expenditure or consumption on non-tradables to gross domestic product (Edwards, 1984). Government expenditure is a term used to describe money that a government spends. Expenditure occurs on every level of government, from local city councils to federal organizations. There are several different types of government expenditure, including the purchase and provision of goods and services, investments, and money transfers.

Public debt to GDP ratio

Public debt to GDP ratio is one of the indicators of the health of an economy. It is the amount of national debt of a country as a percentage of its Gross Domestic Product (GDP). A low debt-to-GDP ratio indicates an economy that produces a large number of goods and services and probably profits that are high enough to pay back debts.

We expect that debt to GDP ratio would impact positively on economic growth given that debt incurred are utilised in financing investments that facilitate output growth.

Money supply (M2) to GDP ratio

The variable best measured as a ratio of money supply to gross domestic product, broad money is a measure of the money supply in an economy and it includes currency and coins, deposits in current account, savings account and fixed and short-term deposits, overnight repos at commercial banks, and non-institutional money market account. This is the main measure of money supply and is the economic indicator usually used to assess the amount of liquidity in the economy. Thus, we expect its coefficient to be positive such that money supply drives investment undertakings and output growth.

Inflation rate

The percentage increase in the price of goods and services, usually annually is termed inflation rate. The persistent and appreciable increase in the general price level in an economy is referred to as inflation. A country with a persistently lower rate of inflation would exhibit an increasing value of currency as well as high purchasing power relative to other currencies while countries with higher inflation normally experience depreciation in their currency in relation to the currencies of their trading partners. It implies that a rise in inflation rate would impact negatively on investment and growth in Nigeria.

Public debt to government revenue ratio
Government revenue is revenue received by a government. It is an important tool of the fiscal policy of the government and is the opposite factor of government spending. Revenues earned by the government are received from sources such as taxes levied on the incomes and wealth accumulation of individuals and corporations and on the goods and services produced, exported and imported from the country, non-taxable sources such as government-owned corporations' incomes, Central bank revenue and Capital receipts in the form of external loans and debts from international financial institutions. Debt to revenue ratio is expected to have a positive slope since debt augments government revenue.

Foreign remittances to GDP ratio
Foreign remittance can be defined as 'the purchase and sale of freely convertible foreign currencies as admissible under Exchange Control Regulations of the country. A looser translation is the sending of money home while working in a foreign country. Thousands of people are currently working and living in a country that is not their home, and sending funds regularly back to their families in their home country. Since foreign remittances are injections into the economy, the remittances are expected to drive investment and growth positively.

Budget deficit to GDP ratio
A budget deficit is when a country's government spends more than it takes in form of taxes or other forms of revenue. The goal is to accelerate output growth. The deficit is financed by borrowing, either externally or domestically or both. The opposite of it is budget surplus. Since budget deficit is an injection into the economy, we expect a positive impact on economic growth in Nigeria.

Public debt service to exports ratio
Public debt servicing is the cash that is required for a particular time period to cover the repayment of interest and principal on public debt. Public debt service is often calculated on a yearly basis. Debt service for a country often includes such financial obligations as external and domestic loans repayment. Countries may have outstanding loans or outstanding interest on borrowed funds or the principal of maturing loans that count towards the country's debt service. Public debt servicing is made from the proceeds of exports and is therefore expected to impact negatively on GDP and GFCF because it is a drain on government revenue.

Foreign direct investment to GDP ratio
Best measured as a ratio of FDI to GDP, foreign direct investment is a direct investment into production or business in a country by a company in another country, either by buying a company in the target country or by expanding

operations of an existing business in that country. Foreign direct investment is in contrast to <u>portfolio investment</u> which is a passive investment in the securities of another country such as <u>stocks</u> and <u>bonds</u>. Since FDI is an injection into the economy, it is expected to impact positively on domestic investment and growth.

Exchange rate

Real exchange rate can simply be described as the domestic relative price of traded to non-traded goods. The real exchange rate measures the relative cost of living between two countries. For example, a rise in the real naira/dollar exchange rate, that is, real depreciation of the naira against the dollar reflects a relative increase in the US cost of living. Conversely, a fall in the real naira/dollar exchange rate, that is; a real appreciation of the naira against the dollar means a relative increase in cost of living of Nigerians. This means that the a priori expectation in this case is that an increase in the exchange value of the naira will negatively affect GDP and GFCF or investment.

External and domestic debts (Public debt)

As borrowing from abroad, external debt is expected to impact on growth just as domestic debt (borrowing from the private sector and other internal sources) is expected to augment government scarce resources (revenue deficit). This features in equation (9) where positive impacts are expected (ceteris paribus). The combination of these variables gives rise to public debt as a principal explanatory variable in equation (10). The overall a priori expectation is that a well utilised public debt would facilitate the growth of output in an economy and therefore impact significantly on growth.

5.1   INTERPRETATION OF RESULTS AND DISCUSSION OF FINDINGS

In equation 1, the coefficient or slope of public debt to export ratio is 1.179880 and its probability value (p-value) is 0.5. Contrary to a priori expectation, the result shows that there exists a positive and significant impact of public debt to export ratio on economic growth in Nigeria. While external reserve to GDP ratio has negatively impacted on GDP growth given the low p-value of 2.0 and a negative coefficient estimate of -20.98038, the total government expenditure to GDP ratio has a negative coefficient as well. It implies that as external reserve is being mismanaged, government expenditure is being channeled into non-productive investments thereby impacting negatively on growth. This could be explained by misplacement of priorities, resource misallocation, insecurity, corruption and embezzlement of public funds by government officials and poor implementation of government policies. These could crowd out private sector investment with far reaching consequences for growth in the economy.

From equation 2, public debt to GDP ratio exhibits a positive impact on economic growth as shown by a positive coefficient value of 0.007326 with a high p-value of 0.01. This is in agreement with the a priori expectation. The ratio of broad money supply to GDP possesses a negative coefficient of -0.089605 with low p-value of 0.4 contrary to a priori expectation. Money supply or broad money to GDP ratio measures the impact of financial deepening on economic growth in the country. Its coefficient or slope, however, signifies a significant negative impact of financial deepening on growth in the economy. This could largely be explained by excess money supply and weak financial intermediation to the real sector. This could have adverse consequences for investment, income, employment, and output growth. Inflation rate, on the other hand, shows a positive but insignificant impact on growth in Nigeria during the period under review. This is surprisingly contrary to the expectation of a negative impact of inflation on economic growth in Nigeria. This could be attributed to relative macroeconomic stability during the period.

In model 3, the ratio of public debt to government revenues has an insignificant negative impact on growth because its coefficient value is -0.324505 with p-value of 0.7. Since public debt is expected to augment government revenue, the result is contrary to a priori expectation. It implies that government spends its revenue on investment and consumption that does not drive growth in the economy. Furthermore, regression result in equation 4 reveals a positive but insignificant impact of public debt service to export ratio on growth as against the a priori expectation. It implies improvement in export revenues during the period. Ratio of FDI to GDP shows a significant negative impact on GDP growth in Nigeria. It implies that the level of FDI attracted into the country is inadequate to stimulate growth, and foreign direct investors are mainly exploiting the economy rather than contributing to its growth. Nevertheless, exchange rate was found to have impacted positively on economic growth but at very insignificant level which is in accord with our expectation that a devalued naira would contribute to growth. The insignificant impact is attributable to the fact that the economy is dominated by the production of primary products whose market is limited at the international market. It means that only industrialised countries could maximally benefit from devaluation policy because they have the superior manufactured output and technology with which to control the world market.

Models 5, 6, 7 and 8 show the impact of the explanatory variables on gross fixed capital formation (or investment) in order to provide corroborative evidence of their impact on economic growth. In equation 5, public debt to export ratio exhibits a negative sign since the coefficient value of -57.25333, and a p-value of 0.34 are indicative of significant negative impact on investment which collaborates the a priori expectation of the study on the variable. Public debt to GDP ratio has

impacted insignificantly and negatively on investment (GCFC) during the period under review contrary to its impact on growth. Technically, this is because the impact of the exogenous variable (autonomous variable or the constant term) in equation 6 is significant on investment while in equation 2 it is insignificant on economic growth. This accounts for the lack of corroboration between the two findings on the impact of debt to GDP ratio in relation to investment on one hand and economic growth on the other. The impact of public debt to government revenues on investment (GFCF) in equation 7 is significantly negative, implying corroborative evidence of earlier findings on same variable in relation to economic growth in equation 3.

Since the focus of the study is on the impact of public debt on economic growth in Nigeria, the discussion of the findings would be to elaborate on the impacts of public debt to export ratio, public debt to GDP ratio, public debt to government revenue ratio as well as public debt service to export ratio on growth in the country. From the regression results and the foregoing interpretations, a 1 per cent decrease in public debt to export ratio would invariably lead to 57.25 per cent significant decrease in investment and 1.2 percent insignificant increase in economic growth in Nigeria. It implies that a decrease in investment for exports in the face of rising public debt would retard the rate of economic growth in the country (see regression results in models 1 and 5 in the appendix). Further, a 1 per cent decrease in the ratio of public debt to GDP would lead to 3.9 per cent decrease in investment and 0.7 per cent increase in economic growth in Nigeria. It implies that as debt keeps accumulating in the absence of debt sustainability, debt burden would build up and investment would fall and this would consequently slow down the pace of economic growth (see regression results in models 2 and 6 in the appendix).

In a related perspective, results obtained in models 3 and 7 reveal that a unit decrease or 1 per cent decline in public debt to government revenue ratio would result in a 273 unit decrease in investment and 35.45 unit decrease in economic growth. Assuming the public debt incurred is utilised would mean that an increase in the ratio of public debt to government revenues would translate into enhanced growth since funds would be made available to finance investment in productive ventures. Conversely, a unit increase in public debt service to export ratio would result in 488.91 unit increase in investment. Similarly, a unit increase in public debt service to export ratio would result in 22.36 per cent increase in economic growth. It implies that a greater change or expansion in investment is required to drive growth. The findings of the study have therefore established a correlated relationship or linkage between investments (gross fixed capital formation) and GDP or output growth (economic growth).

From the foregoing findings, it becomes imperative to test for debt overhang and

the overall impact of public debt on economic growth in Nigeria using three sets of data: 1970-1985, 1986-2004, and 1970-2010 (see full data in Table 1 in the appendix region). As a prelude, regression results in model 9 (see appendix) shows that the impact of total domestic debt on growth is significantly positive in both pre-reform and reform periods (1970-2010) while external debt has exhibited a significant negative impact on growth during the same period. Furthermore, regression result in model 10a (see appendix) gives the overall impact of public debt on growth in pre-reform period (1970-1985) – when there was no debt overhang problem. The findings reveal that public debt had significantly and positively impacted on economic growth in Nigeria as at then. It shows that a unit increase in the quantum of public debt would lead to 0.47 unit increase in growth during the period. However, regression result in model 10b involving data set (1986-2004) during which debt overhang was a problem, has shown that public debt has had a positive (though insignificant) impact on growth in the country. The slight positive impact of public debt on economic growth could be explained by the cumulative significant positive impact of domestic debt on growth over the significant negative impact of external debt on growth during the reform period as revealed by the result in appendix 9a and 9b. This is an indication that the results are reliable enough to support the conclusion that the overall impact of public debt on economic growth is generally insignificant in Nigeria.

The coefficient of the SAP dummy
my (Dsap) gives a negative sign in almost all the equations, meaning that structural adjustment or reform (occasioned by debt overhang problem) has not been able to drive economic growth in Nigeria. However, demo coefficient of 8.606140 is an indication that democratic governance has impacted positively on economic growth in the country during the period under consideration.

6.1   CONCLUSION AND POLICY RECOMMENDATIONS

Though with some positive effects, the study shows that the impact of public debt on economic growth in Nigeria for the period 1986 to 2010 is adjudged insignificant. This obviously implies that the funds generated through public borrowing have not been translated into concrete growth. Based on the findings of the study, the paper suggests that borrowed funds should be properly utilised for long term intentions by investing in development schemes, infrastructural projects, human capital development as well as research and development (R&D). This should be the overriding focus of public debt policy as it would translate into increases in industrial and technological development with positive consequences on investment, employment, income, output, export expansion, and government revenue. Government should ensure debt sustainability in order to avoid debt overhang as experienced in the past. It implies that government should strive to settle

outstanding public debt in accordance with the repayment schedule whereas external debt should be used for long-term development purposes. This will give room for proper conduct of fiscal and monetary policies that would transmit policy impulses into the real economy.

Government should as matters of priority formulate policies that will make the agricultural sector attractive in order to resuscitate the manufacturing sector and boost industrialisation in Nigeria. This will draw foreign investors to invest and transform the real economy because agricultural revolution is the foundation for industrial take-off and sustainable economic growth. Thus, FDI policies should be sector specific, with the real economy as the target. Government should also attract genuine foreign investors to invest in the health sector because a healthy people would drive a healthy and prosperous economy. Nigerian people should be most enterprising and productive in order to leverage on the FDI in the country.

The study recommends that government should finance budget deficit by improving on the present revenue base rather than resorting to public borrowing even for unjustifiable purposes. This can be achieved by improving its revenue sources and efficient pursuit of tax reforms. Government should maintain a debt-bank deposit ratio of not more than 30 percent and resort to increased use of tax revenue to finance its projects since tax revenue collection is far from the optimum level in Nigeria.

Considering the insignificant impact of public debt on investment and economic growth in Nigeria during the period under review, the paper gives two major suggestions. First, government should divest itself of all projects which the private sector can handle including refining crude oil (petroleum product) and transportation but should provide enabling environment for private sector investors such as tax holidays, subsidies, guarantees and most importantly improved infrastructure. Second, government should maintain a proper balance between short term and long term debt instruments in such a way that long term instruments dominate the debt market. Even if the ratio of the long term debt is a multiple of deposit, the economy can still accommodate it so long as borrowed funds are channeled towards improving Nigerian investment climate.

Government should employ wider reforms that promote investment in treasury bonds and encourage institutional investors. More importantly, for public debt to significantly impact growth, government should show real commitment beyond lip service in eradicating corruption. This would eliminate waste arising from debt mismanagement and diversion of borrowed funds for corrupt purposes. To curb corruption, government should therefore pass into law the principle of 'Death by Hanging' for any person or group of persons caught and proved guilty of corruption

and corrupt practices in Nigeria– the Chinese model of getting rid of corruption.

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APPENDICES

Table 1: Raw Data of Nigeria's Public Debt, Foreign Direct Investment (FDI), and Foreign Remittances (FREM) from 1970 to 2010 (Millions of Naira)

YEAR	GDP	EXTERNAL DEBT	DOMESTIC DEBT	TOTAL PUBLIC DEBT	FDI	FREM
1970	5,281.1	na	111.0	111.0	143.5	na
1971	6,650.9	465.1	674.7	1139.8	200.2	na
1972	7,187.5	509.0	761.8	1270.8	215.7	13.14
1973	8,630.5	792.6	853.1	1645.7	261.1	21.95
1974	18,823.1	802.4	601.9	1404.3	180.2	37.17
1975	21,475.2	704.2	740.3	1444.5	296.2	65.98
1976	26,655.8	567.7	1015.9	1383.6	213.6	88.20
1977	31,520.3	637.1	1563.9	2201.0	286.3	129.35
1978	34,540.1	1602.7	2260.5	3863.2	128.7	154.33
1979	41,970.7	2359.9	2017.3	4377.2	185.8	213.60
1980	49,632.3	1,866.8	8,215.6	10,082.4	330.8	313.80
1981	47,619.7	2,331.2	11,192.6	13,523.8	295.3	295.24
1982	49,069.3	8,819.4	15,007.6	23,827.0	289.4	261.08
1983	53,107.4	10,577.7	22,221.4	32,799.1	263.9	294.48
1984	59,622.5	14,808.7	25,672.1	40,480.8	151.3	239.52
1985	67,908.6	17,300.6	27,949.1	45,250.1	437.0	267.85
1986	69,147.0	41,452.4	28,440.2	69,891.1	390.5	300.01
1987	105,222.8	100,789.1	36,790.6	137,578.2	2442.2	86.64
1988	139085.3	133,956.3	47,031.1	180,985.9	1719.12	165.15
1989	216797.5	240,393.7	47,049.6	287,443.3	13943.5	211.70
1990	267550.0	298,614.4	84,093.1	382,707.5	4727.5	72.00
1991	312139.7	328,453.8	116,198.7	444,652.5	7059.6	540.15
1992	532613.8	544,264.1	177,961.7	722,225.8	15511.9	595.12
1993	683869.8	633,144.4	273,836.4	906,980.8	29732.7	51.05
1994	899863.2	648,813.0	407,582.7	1,056,395.7	43102.8	77.00
1995	1933212 .0	716,865.6	477,733.9	1,194,599.5	23744.6	103.04
1996	2702719.0	617,320.0	419,975.6	1,037,295.6	35057.0	38.50
1997	2801973.2	595,931.9	501,751.1	1,097,683.0	33858.0	84.84
1998	2708431.4	633,017.0	560,830.2	1,193,847.2	23024.1	102.52
1999	3194015.9	2,577,374.4	794,806.6	3,371,181.0	93457.6	874.20
2000	4582127.7	3,097,383.9	898,253.9	3,995,637.8	116419.7	153.17
2001	4725086.1	3,176,291.0	1,016,994.0	4,193,265.0	133350.6	672.00
2002	6912381.3	3,932,884.8	1,166,000.7	5,098,885.5	226758.8	108.90
2003	8487032.8	4,478,329.3	1,329,692.7	5,808,019.3	259417.3	1548.00
2004	11411067.0	4,890,269.6	1,370,325.2	6,260,589.6	251120.0	2814.67
2005	14572239.1	2,695,072.2	1,525,910.0	4,220,982.2	658442.7	12954.00
2006	18564595.7	451,461.7	1,753,250.0	2,204,711.7	616511.3	13101.24
2007	20657318.5	431,079.8	2,169,630.0	2,600,709.8	760406.2	6804.00
2008	24296329.2	493,180.2	2,320,310.0	2,813,490.2	975396.6	6922.23
2009	24712670.1	590,441.1	3,228,030.0	3,818,471.1	1274671.2	7004.49
2010	29108024.5	723,200.0	4,700,600.0	5,423,800.0	924545.1	7259.29

Source: CBN Statistical Bulletin & Annual Report and Statement of Accounts (various issues), World Bank Reports/African Development Indicators (2012)
na = not available

Table 2: Unit root and co-integration

VARIABLE	LEVEL OF STATIONARITY	ADF VALUE	5% SIGNIFICANT VALUE
? GFCF	I(0)	-2.889574	-1.96
? GDP	I(0)	-2.168793	-1.96
DOD/EXP	I(1)	-5.194154	-1.96
ExtR/GDP	I(1)	-3.942580	-1.96
TGE/GDP	I(1)	-5.038409	-1.96
DOD/GDP	I(1)	-5.194154	-1.96
M2/GDP	I(1)	-2.091795	-1.96
InflR	I(1)	-5.918509	-1.96
DOD/Rev	I(1)	-4.965789	-1.96
FREM/GDP	I(0)	-3.097317	-2.99
BD/GDP	I(1)	-3.992240	-1.96
DS/EXP	I(1)	-5.783723	-1.96
FDI/GDP	I(1)	-3.240109	-1.96
ExchR	I(1)	-2.446314	-1.96

Source: Researcher's Computation

Model 1: Regression Results for Equation 1

Dependent Variable: GDP
Method: Least Squares
Date: 06/22/13   Time: 00:40
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.341586	4.833998	0.484399	0.6339
DODEXP	1.179880	0.573908	2.055871	0.0546
EXTRESV	-20.98038	17.05972	-1.229819	0.2346
TGEXGDP	-169.8647	60.75670	-2.795819	0.0119
DSAP	-0.451721	2.647603	-0.170615	0.8664
DEMO	8.606140	5.201765	1.654466	0.1154
TREND	-0.399442	0.398751	-1.001734	0.3297

R-squared	0.531710	Mean dependent var		4.633600
Adjusted R-squared	0.375613	S.D. dependent var		6.422009
S.E. of regression	5.074553	Akaike info criterion		6.317850
Sum squared resid	463.5196	Schwarz criterion		6.659135
Log likelihood	-71.97312	F-statistic		3.406284
Durbin-Watson stat	1.438602	Prob(F-statistic)		0.020044

Model 2: Regression Results for Equation 2

Dependent Variable: GDP
Method: Least Squares
Date: 06/22/13   Time: 00:47
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.051793	4.223125	0.012264	0.9903
DODGDP	0.007326	0.002702	2.711924	0.0143
M2GDP	-0.089605	0.096678	-0.926839	0.3663
INFLRATE	0.050438	0.058680	0.859547	0.4013
DSAP	-1.051372	2.527791	-0.415925	0.6824
DEMO	1.486199	4.527772	0.328241	0.7465
TREND	-0.375252	0.285609	1.313868	0.2054

R-squared	0.542233	Mean dependent var		4.633600
Adjusted R-squared	0.389644	S.D. dependent var		6.422009
S.E. of regression	5.017211	Akaike info criterion		6.295121
Sum squared resid	453.1034	Schwarz criterion		6.636407
Log likelihood	-71.68902	F-statistic		3.553556
Durbin-Watson stat	1.609154	Prob(F-statistic)		0.016869

Model 3: Regression Results for Equation 3

Dependent Variable: GDP
Method: Least Squares
Date: 06/22/13   Time: 00:50
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.772786	6.800644	0.407724	0.6883
DODGOVREV	-0.324505	0.878492	-0.369388	0.7161
FOREMGDP	-1.029216	5.080971	-0.202563	0.8417
BDGDP	10.71840	47.97559	0.223414	0.8257
DSAP	-1.303646	4.295218	-0.303511	0.7650
DEMO	2.252505	5.829473	0.386399	0.7037
TREND	-0.256951	0.531199	0.483719	0.6344

R-squared	0.299113	Mean dependent var		4.633600
Adjusted R-squared	0.065484	S.D. dependent var		6.422009
S.E. of regression	6.208179	Akaike info criterion		6.721108
Sum squared resid	693.7468	Schwarz criterion		7.062393
Log likelihood	-77.01385	F-statistic		1.280291
Durbin-Watson stat	1.523785	Prob(F-statistic)		0.315023

Model 4: Regression Results for Equation 4

Dependent Variable: GDP
Method: Least Squares
Date: 06/22/13   Time: 00:52
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.286585	6.610364	0.648464	0.5249
DSEXP	22.35597	9.235523	2.420651	0.0263
FDIGDP	-151.6740	50.99789	-2.974124	0.0081
EXCHRATE	0.021550	0.128320	0.167943	0.8685
DSAP	0.884755	2.349780	0.376527	0.7109
DEMO	0.679414	10.28292	0.066072	0.9480
TREND	-0.088388	0.544917	0.162204	0.8730

R-squared	0.629835	Mean dependent var		4.633600
Adjusted R-squared	0.506447	S.D. dependent var		6.422009
S.E. of regression	4.511675	Akaike info criterion		6.082710
Sum squared resid	366.3938	Schwarz criterion		6.423995
Log likelihood	-69.03387	F-statistic		5.104500
Durbin-Watson stat	1.827455	Prob(F-statistic)		0.003199

Model 5: Regression Results for Equation 5

Dependent Varia ble: GFCF
Method: Least Squares
Date: 06/22/13   Time: 00:56
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1041.492	501.9094	2.075059	0.0526
DODEXP	-57.25333	59.58830	-0.960815	0.3494
EXTRESV	3386.932	1771.295	1.912122	0.0719
TGEXGDP	-1827.267	6308.311	-0.289660	0.7754
DSAP	146.5854	274.8981	0.533235	0.6004
DEMO	194.6511	540.0943	0.360402	0.7227
TREND	-93.33535	41.40190	-2.254373	0.0369
R-squared	0.370911	Mean dependent var		-112.4748
Adjusted R-squared	0.161215	S.D. dependent var		575.2962
S.E. of regression	526.8861	Akaike info criterion		15.60334
Sum squared resid	4996961.	Schwarz criterion		15.94463
Log likelihood	-188.0418	F-statistic		1.768804
Durbin-Watson stat	1.662588	Prob(F-statistic)		0.162479

Model 6: Regression Results for Equation 6

Dependent Variable: GFCF
Method: Least Squares
Date: 06/22/13   Time: 00:58
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1001.186	430.1856	2.327335	0.0318
DODGDP	-0.038959	0.275189	-0.141572	0.8890
M2GDP	-27.91853	9.848069	-2.834924	0.0110
INFLRATE	-0.882181	5.977399	-0.147586	0.8843
DSAP	-17.49780	257.4915	-0.067955	0.9466
DEMO	356.8471	461.2181	0.773706	0.4491
TREND	-36.60744	29.09332	-1.258276	0.2244
R-squared	0.408102	Mean dependent var		-112.4748
Adjusted R-squared	0.210803	S.D. dependent var		575.2962
S.E. of regression	511.0746	Akaike info criterion		15.54240
Sum squared resid	4701550.	Schwarz criterion		15.88369
Log likelihood	-187.2800	F-statistic		2.068442
Durbin-Watson stat	1.611043	Prob(F-statistic)		0.108499

Model 7: Regression Results for Equation 7
Dependent Variable: GFCF
Method: Least Squares
Date: 06/22/13   Time: 01:02
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1051.720	345.1477	3.047159	0.0069
DODGOVREV	-272.6715	44.58542	-6.115710	0.0000
FOREMGDP	-248.5194	257.8704	-0.963737	0.3479
BDGDP	690.8932	2434.867	0.283750	0.7798
DSAP	165.7480	217.9918	0.760341	0.4569
DEMO	-320.7255	295.8586	-1.084050	0.2926
TREND	-11.38302	26.95953	0.422226	0.6779
R-squared	0.775034	Mean dependent var		-112.4748
Adjusted R-squared	0.700046	S.D. dependent var		575.2962
S.E. of regression	315.0788	Akaike info criterion		14.57502
Sum squared resid	1786943.	Schwarz criterion		14.91630
Log likelihood	-175.1877	F-statistic		10.33536
Durbin-Watson stat	2.179312	Prob(F-statistic)		0.000052

Model 8: Regression Results for Equation 8
Dependent Variable: GFCF
Method: Least Squares
Date: 06/22/13   Time: 01:04
Sample: 1986 2010
Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	130.7674	834.5335	0.156695	0.8772
DSEXP	488.9175	1165.950	0.419330	0.6799
FDIGDP	-2411.494	6438.292	-0.374555	0.7124
EXCHRATE	-26.74042	16.19986	-1.650657	0.1161
DSAP	120.2914	296.6508	0.405498	0.6899
DEMO	2390.025	1298.180	1.841058	0.0822
TREND	29.72880	68.79375	0.432144	0.6708
R-squared	0.264825	Mean dependent var		-112.4748
Adjusted R-squared	0.019767	S.D. dependent var		575.2962
S.E. of regression	569.5819	Akaike info criterion		15.75918
Sum squared resid	5839624.	Schwarz criterion		16.10046
Log likelihood	-189.9897	F-statistic		1.080661
Durbin-Watson stat	1.567148	Prob(F-statistic)		0.410254

Model 9a: Regression result for data set (1970-2010) for eqn (9)
Dependent Variable: GDP
Method: Least Squares
Date: 09/06/13   Time: 11:44
Sample(adjusted): 1971 2010
Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-33368.12	435908.4	-0.076548	0.9394
TDD	7.737977	0.365929	21.14609	0.0000
TED	-0.345106	0.277756	-1.242477	0.2219
R-squared	0.929557	Mean dependent var		4627998.
Adjusted R-squared	0.925749	S.D. dependent var		8017451.
S.E. of regression	2184672.	Akaike info criterion		32.10387
Sum squared resid	1.77E+14	Schwarz criterion		32.23053
Log likelihood	-639.0774	F-statistic		244.1243
Durbin-Watson stat	1.262992	Prob(F-statistic)		0.000000

Model 9b: Regression result for data set (1970-1985) for equation (9)
Dependent Variable: GDP
Method: Least Squares
Date: 09/06/13   Time: 11:26
Sample(adjusted): 1971 1985
Included observations: 15 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21176.09	3664.077	5.779380	0.0001
TDD	2.516351	1.117474	2.251821	0.0439
TED	-1.513307	1.959057	-0.772467	0.4548
R-squared	0.739838	Mean dependent var		34960.93
Adjusted R-squared	0.696478	S.D. dependent var		19705.16
S.E. of regression	10856.14	Akaike info criterion		21.59971
Sum squared resid	1.41E+09	Schwarz criterion		21.74132
Log likelihood	-158.9978	F-statistic		17.06254
Durbin-Watson stat	2.319181	Prob(F-statistic)		0.000310

Model 10a: Regression result for data set (1970-1985) for equation (10)

Dependent Variable: GDP
Method: Least Squares
Date: 09/06/13   Time: 15:26
Sample(adjusted): 1972 1985
Included observations: 14 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13089.95	4812.605	2.719930	0.0216
PUBDEBT	0.475424	0.124454	3.820075	0.0034
FDI	-5.981448	19.17720	-0.311904	0.7615
FREM	112.0276	17.78159	6.300203	0.0001
R-squared	0.942759	Mean dependent var		36983.08
Adjusted R-squared	0.925586	S.D. dependent var		18764.54
S.E. of regression	5118.762	Akaike info criterion		20.15417
Sum squared resid	2.62E+08	Schwarz criterion		20.33676
Log likelihood	-137.0792	F-statistic		54.89952
Durbin-Watson stat	0.817795	Prob(F-statistic)		0.000002

Model 10b: Regression result for data set (1986-2004) for equation (10)

Dependent Variable: GDP
Method: Least Squares
Date: 09/06/13   Time: 15:41
Sample: 1986 2004
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	61700.75	313600.0	0.196750	0.8467
PUBDEBT	0.631618	0.480024	1.315806	0.2080
FDI	15.75934	11.52177	1.367788	0.1915
FREM	830.7540	425.2145	1.953729	0.0696
R-squared	0.936532	Mean dependent var		2772860.
Adjusted R-squared	0.923839	S.D. dependent var		3210244.
S.E. of regression	885940.5	Akaike info criterion		30.41135
Sum squared resid	1.18E+13	Schwarz criterion		30.61018
Log likelihood	-284.9078	F-statistic		73.78039
Durbin-Watson stat	1.281485	Prob(F-statistic)		0.000000

Model 10c: Regression result for data set (1970-2010) for equation (10)
Dependent Variable: GDP
Method: Least Squares
Date: 09/06/13   Time: 16:00
Sample(adjusted): 1972 2010
Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	41819.90	337272.0	0.123995	0.9020
PUBDEBT	0.662275	0.173786	3.810853	0.0005
FDI	19.89703	1.642783	12.11178	0.0000
FREM	226.1452	141.1098	1.602618	0.1180
R-squared	0.961692	Mean dependent var		4746494.
Adjusted R-squared	0.958409	S.D. dependent var		8086696.
S.E. of regression	1649197.	Akaike info criterion		31.56639
Sum squared resid	9.52E+13	Schwarz criterion		31.73701
Log likelihood	-611.5446	F-statistic		292.8841
Durbin-Watson stat	2.440855	Prob(F-statistic)		0.000000

Addendum 1: Autocorrelation/Heteroscedasticity Results for Equation 1
Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.245051	Probability	0.140307
Obs*R-squared	5.529086	Probability	0.063005

White Heteroskedasticity Test:

F-statistic	0.697713	Probability	0.712201
Obs*R-squared	8.382137	Probability	0.591564

Addendum 2: Autocorrelation/ Heteroscedasticity Results for Equation 2
Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.403320	Probability	0.276261
Obs*R-squared	3.782823	Probability	0.150859

White Heteroskedasticity Test:

F-statistic	1.824221	Probability	0.153747
Obs*R-squared	14.01351	Probability	0.172376

Addendum 3: Autocorrelation and Heteroscedasticity Results for Equation 3

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.013532	Probability	0.986571
Obs*R-squared	0.043225	Probability	0.978620

White Heteroskedasticity Test:

F-statistic	0.892758	Probability	0.563524
Obs*R-squared	9.771344	Probability	0.460778

Addendum 4: Autocorrelation and Heteroscedasticity Results for Equation 4

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.455582	Probability	0.642569
Obs*R-squared	1.374378	Probability	0.502988

White Heteroskedasticity Test:

F-statistic	0.445272	Probability	0.897247
Obs*R-squared	6.123126	Probability	0.804815

THRESHOLD ANALYSIS OF BUDGET DEFICIT AND ECONOMIC GROWTH IN SIERRA LEONE

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ABSTRACT

The deteriorating budget deficit over time in Sierra Leone has prompted policy makers to look for measures to improve the budget balance by focusing on reducing government expenditures as a primary approach to tackle the issue of budget deficit. As governments normally run deficits to sustain economic growth or provide stimulus for economic recovery based on the Keynesian framework, the effectiveness of a budget deficit needs to be determined so that the appropriate government budget position can be maintained to best suit the economic circumstance of the country. Without definite empirical framework to guide policy maker on the level of budget deficit that is appropriate for economic growth in Sierra Leone, the danger of government running excessive deficits that might destabilize the economy cannot be ruled out. This paper estimates the threshold level of Budget deficit that is conducive for growth in Sierra Leone using the non-Linear Least Squares approach following Khan and Senhadji (2001) and Onwioduokit (2012). The empirical results indicate that the threshold level of Budget deficit conducive for economic growth for Sierra Leone was identified at 7.0 percent. The findings of this paper provide ample evidence in support of the proposition that Budget deficit beyond certain threshold is detrimental to growth. This suggests that the Sierra Leonean authorities should endeavour to implement policy measures aimed at reducing Budget deficits to levels below or equal to 7.0 per cent (levels consistent with economic growth).

1.0   Introduction

The world over, governments usually run deficits to sustain economic growth or provide stimulus for economic recovery. The effectiveness of such policy needs to be determined in order to be able to appropriately determine government budget position that is best suited for economic growth at any point in time. This is also to avoid the danger of government running excessive deficits that might destabilize the economy. In recent times the Sierra Leonean authorities have

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expressed concern over the widening budget deficits. This is because more debt might be required to finance the deficits should it continue at the current rate. Since there are currently no guidelines for policymakers regarding what level of budget deficit to be maintained, there is a possibility that deficit could increase to a level that is detrimental to growth and thus pose great risk of insolvency in the future.

Disproportionate deficits, regardless of the mode of financing, are assumed to be growth retarding. For instance, deficits financed through arrears tantamount to the imposition by the government of an illegal and unexpected tax on its local creditors. This will lead to abrupt reduction in the profitability of local investors, dimple relationship between the private and the public sectors, or perhaps create a crisis of confidence and thus dampened private initiative. Even when the accumulation is limited to domestic arrears, the damage done to the profitability of national ventures could be huge and the country's credibility could be dented.

With respect to deficit financed through monetary expansion which amounts to imposition of an inflation tax, the real value of private claims on the government could be eroded. Beaugrand (2004) notes that the negative effects on economic activity and social peace of continued attempts to impose the inflation tax will create uncertainty and, in particular, real interest rates and real exchange rates instability. The external financing option of deficits through the issue of foreign liabilities or accumulation of external arrears, could through the market perception of the risk of future debt-servicing difficulties, push up the country's risk premium, raising the country's cost of borrowing in the world financial markets.

The effect of budget deficit on economic growth is one of the vastly disputed issues in economics. There is no consensus among economists on this issue either theoretically or empirically. The conventional view is that budget deficit is the main source of macroeconomic instability. Empirical studies, however, do not conclusively support this assertion as results are mixed and controversial across countries, data and methodologies. A strand of the argument, following Keynes is that budget deficits accelerate capital accumulation and growth (Krishnamurthy, 1984; and Chandrasekhar, 2000). The accent here is that enlarged Budget deficit as a result of public sector investment, particularly in infrastructure, encourages growth in the private sector. Increasing public investment within an appropriate policy framework, gives the private sector adequate composure and incentives to invest leading to overall economic growth.

On the other hand, as articulated by Bernheim (1989), neoclassical school envisions farsighted individuals planning consumption over their own life cycles. Through budget deficits, individuals raise total lifetime consumption by shifting taxes to subsequent generation. If economic resources are fully employed, increased

consumption implies decreased saving and interest rates must then rise to bring capital markets into balance. Thus, persistent deficits crowd out private capital accumulation and can be highly detrimental to the economy.

Sierra Leone has never recorded a budget deficit excluding grants of less than 5.0 percent in the past one decade. The country recorded respective budget deficit rates of 16.5 percent, 11.7 percent, 10.0 percent, and 8.6 percent in 2001, 2002, 2003 and 2004. In 2005 the rate of 9.6 percent was recorded. Subsequently, the deficit rate dropped to 8.6 percent (2006) and 5.0 percent (2007).Since recording 7.9 percent in 2008, the deficit has trended upwards reaching 10.4 and 14.1 percent in 2009 and 2010, respectively.

Figure 1: Budget deficit/GDP, Output and Inflation (2001-2010)
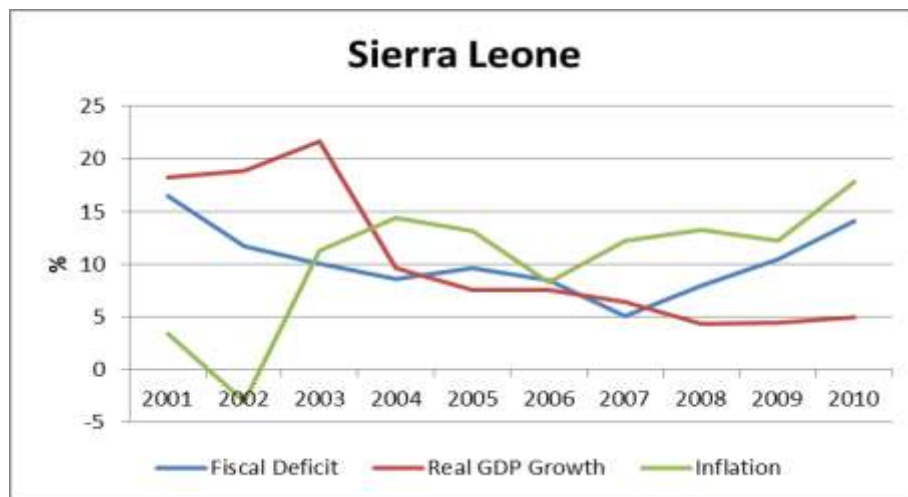
In the last decade inflation rate in Sierra Leone has been in double digits, except in 2002 and 2006 when single digits were recorded. Inflation decelerated from 13.2 percent in 2008 to 12.2 percent in 2009 but the trend was reversed in 2010 when 17.8 percent inflation rate was recorded. Persistent depreciation of the Leone and increases in the domestic fuel prices adversely impacted on the domestic prices via increased transport costs. Furthermore, the financing of government deficits from central bank was seen as the causes of inflation in 2009 and 2010. The growth rate of the economy has been very strong exceeding 5.0 percent in all the years (2001-2010) with the exception of 2009 when the economy grew by 4.0 percent. The observed trend in the growth rate was driven by buoyant service sector and increased agricultural production.

The conventional belief that fiscal deficit is detrimental to output growth, has compelled policy makers in Sierra Leone and elsewhere to attempt to operate balanced budget. However, a strand of the literature both theoretic and empirical also seems to suggest that fiscal deficit is growth enhancing. This therefore poses a dilemma for policy makers: In effect, how low should deficit be? Should the deficit target be 0.0 percent, 2.0 percent, 6.0 per cent, 10.0 per cent or what percent? Broadly, at what level of deficit does the relationship between deficit and output growth turn negative? These are some of the quandaries that several empirical studies have examined, centering explicitly on whether the relationship between deficit and output growth is a nonlinear one.

Put differently, at some (low) level of deficit, the relationship is assumed to be either positive or nonexistent, but at an elevated level it is assumed to be negative. If such a nonlinear relationship exists, then it should be possible, in principle, to estimate the inflexion point, or threshold, at which the sign of the relationship between the two variables would switch. The possibility of such a nonlinear relationship has been identified by Adams and Bevan (2002) and Onwioduokit (2012).

The lack of threshold levels to serve as guidelines in maintaining and ensuring that deficit level is on a sustainable path could cause the fiscal position of the country to go out of control as there are no empirically established formal guidelines for policymakers to adhere to when it comes to budget deficits. The key objective of this paper is to estimate the threshold level of budget deficit that is conducive to economic growth in Sierra Leone. Determining appropriate threshold for this significant indicator is critical in the overall economic management as it would inform policy in Sierra Leone. The remaining part of the paper is organized as follows: Part II reviews theoretical and empirical literature while part III contains analytical framework. The results are presented in Part IV. Part V contains summary and some concluding remarks.

2.0   THEORETICAL AND EMPIRICAL REVIEWS

Theoretical conclusions regarding the relationship between budget deficit and economic growth are contentious. While the Keynesians opine that there is a positive relationship between these two variables, the neo classicals argue the opposite. Meanwhile, the Ricardian equivalence hypothesis claims that there is a neutral relationship between budget deficit and economic growth. The differences in terms of opinions and analyses reflect the influence of various factors including time dimension, the level of economic development of the countries, forms of government administration and method of analysis as well as the level of budget deficit (Briotti, 2004).

Brender and Drazen (2008) opine that budget deficit can also reduce the economic growth of a country based on the perspective of politics and election process. They note that high budget deficits recorded by a country will give negative signals to the citizens on the ability of the government to perform well in managing the funds of a country. As a result, there is a probability of re-election process to be conducted in order to replace the authorities. Indirectly, the authorities who did not perform well may not be able to bring the country to the upper level. Hence, it will not contribute to high economic growth due to lack of confidence among citizens, investors and other neighbouring countries.

Also, Benos (2005), consistent with the Ricardian equivalence hypothesis, argue that the budget surplus that is currently recorded by the government will be used to finance future deficits. Therefore, an increase in the budget deficit will not impact the economic growth since it is financed through previous surplus. Bivens (2010) asserts that government borrows money internally or externally in order to finance budget deficit. An increase in the demand of the loanable funds by the government will distort the level of private investment due to an increase in the interest rate. The decline in the private investment will definitely reduce the level of economic growth.

2.1   EMPIRICAL REVIEW

Empirical findings on the relationship between Budget deficit and economic growth have been mixed. Barro (1979) reports a positive and significant impact of budget deficit on growth. Kormendi, and Meguire (1985) arrive at a similar conclusion that budget deficit enhances growth, based on the cross sectional analysis. Fischer (1993) finds that huge budget deficit helped Morocco and Italy to grow since the excessive spending helped to increase the level of private consumption in the short-run. From consumer perspectives, deficits were used to reduce the burden of taxation.

Aschauer (1989) applies annual data on the US over the period 1953-1986 to examine the effect of government deficit on private investment and the rate of return to private capital. He found that an increase in public investment arising from deficit reduced private investment nearly one-to-one as the private sector utilizes the public capital for its required purposes rather than expand private capacity. At a deeper level, a distinctive feature of public infrastructure capital is that it complements private capital in the production and distribution of private goods and services. Hence, public investment is expected to raise private investment as the former raises the profitability of private capital stock. The empirical results indicated that while both channels appear to be operating paripasau, the later dominates, so the net effect of a rise in deficit financed public investment had a positive effect on private investment. This implies that government deficit financed

investment had a positive effect on private investment and caused crowding-in rather than crowding-out.

Glannaros and Kolluri (1989) apply the OLS technique on the fisher equation and the IS-LM general equilibrium model by using data set of five industrial countries from (1965-1985). The analysis yielded three different results; first, there is a negative relation between interest rate and inflation, second, there is an indirect significant effect of budget deficit on interest rate, third, the study did not find any clear relation between variables with the help of other exogenous variables. Easterly et al (1993) reported a consistently negative relationship between growth and budget deficits. Fischer (1993) findings support Easterly et al (1993) results and conclude that large budget deficits and growth are negatively related. Among other variables including inflation and distorted foreign exchange markets, the author emphasized the importance of a stable and sustainable fiscal policy, to achieve a stable macroeconomic framework.

Anusic (1993) investigates the relationship between budget deficit and economic growth in the Republic of Croatia using data from (1991-1992). He finds that deficit is a priori harmful for the proper and smooth economic system. He refers to the Keynesian economic theory; the increase in budget deficit will cause an increase in real interest rate, this increase will cause decrease in real investment. The author concludes that the impact of budget deficit on overall economy is harmful. However, he points out that the outcome also depended on the internal condition and way of financing by the country. Ball et al (1995) note that in the long-run, huge budget deficits ruined the level of economic growth for countries since they have to struggle in paying back the national debts. However, Ghali (1998) reports a neutral relationship between budget deficit and economic growth in Saudi Arabia.

In a related study, Al-Khedar (1996), applies VAR model on data of G-7 countries for the period 1964-1993 and reports that budget deficit had a positive and significant impact on the economic growth of these countries. He also avers that the deficit negatively affects the trade balance. Hakkio's (1996) studies of the USA, Finland, Sweden and Germany for the period of 1979-1995 could not establish any empirical association between deficit and economic growth in the economies of United States of America (USA) and Germany. However, by applying simple regression technique and considering data from Sweden and Finland he was successful in establishing a negative relationship between budget deficit and the exchange rate.

Jenkins (1997) motivated by the persistent deficits in Zimbabwe, examines public sector deficits and macroeconomic stability in Zimbabwe. The author identified an intense debt problem, drought and terms of trade shocks coupled with the

government's unwillingness to engage in fiscal adjustment as fundamental macroeconomic setbacks in Zimbabwe. Findings of the study show that uncertainty caused by the growing public-sector debt reduced private investment and further resulted in a decline in growth. The macroeconomic model explored by the researcher shows that the variable with greatest influence on overall growth was agricultural output. However, the budget deficit exercises an unambiguously negative impact on exports. It also reduces private welfare, worsens income distribution and reduces employment. The author concludes that the growth of government resulted in a drain on the economy, rather than facilitate economic growth and development.

Cebula (1988) avers that, the crowding-out effect surfaces as the budget deficit burden increases. The author reports a strong, significant and positive relationship between the budget deficit and the long-term nominal rate of interest in a study conducted for the period 1971 to 1984 on United States of America. Anyanwu (1998) deviated manifestly from past studies that focused more on the effects of deficits and concentrated on the impact of deficits financing. He applies regression analysis to pooled cross-section and time series data for Nigeria, Ghana and the Sierra Leone. The results did not reveal a significant positive association between overall budget deficits (and its foreign financing) and domestic nominal deposit interest rates. However, the author reports a significant positive relation between domestic financing of the budget deficits and domestic nominal deposit rates. He concludes that the concern of economists in the Sub-region should shift from the deficits itself to the manner of financing the deficit.

Mugume and Obwona (1998), concerned about the role of fiscal deficit in the reform programme in Uganda, investigate public sector deficits and macroeconomic performance in Uganda. The study set out to provide a more systematic modelling framework to explain the interrelationships between budget deficits, current account deficits and real exchange rate depreciation. Another focus of the research was to analyze the behaviour of important aggregate variables such as price level, current account balance, external sector and money stock as influenced directly and indirectly by changes in Budget deficits. A miniature macroeconomic model that captured the interactions between exports, import, real exchange rate, government expenditure, price, and money supply was specified. The empirical strategy attempted to build an integrated model linking the public sector with the financial market and then generate implications for the conduct of fiscal policy. A distinct finding of the estimations was the observed interaction of the public sector and monetary sector. He concludes that deficit positively relate with economic growth.

Bahmani (1999) applied the Johansen Juselius co-integration technique to

investigate the relationship between the budget deficit and investment, using quarterly data for the period of 1947-1992 for the U.S.A. The author reported a 'crowding in' impact of the budget deficit on real investment, which is a validation of the Keynesian arguments regarding the expansionary effect of the budget deficit on investment. Olaniyan (2000) measures the effects of economic instability on aggregate investment in Nigeria. Using a classic reduced form of investment equation with measures of instability among which includes, budget deficits; he finds that fiscal deficit depressed investment in Nigeria.

Ahmed and Miller (2000) in a cross-sectional study of thirty nine states utilizing data for the period 1975-1984, using Ordinary Least Squares model (OLS), fixed effect and random effect methods maintain that government spending can be segregated into two parts: First, the spending on social security and welfare of its people; this reduces investment; Second, the spending on communication sector, including transport, increases investment by the private sector in less developed countries (LDCs). He reports that reduction in investment led to less revenue generation, hence causing deficit, and vice-versa when spending in transport and communication was analysed.

Adams and Bevan (2002) assess the relation between budget deficits and growth in a panel of forty five (45) developing countries. An overlapping generation's model in the tradition of Diamond (1965) that incorporates high-powered money in addition to debt and taxes was specified. The estimation strategy involves a standard fixed effect panel data estimation and bi-variate linear regression of growth on the budget deficits using pooled data. An important contribution of the empirical analysis is the existence of a statistically significant non-linearity in the impact of budget deficit on growth. However, this non-linearity, the authors argue, reflected the underlying composition of deficit financing.

In effect, the authors posit that for a given level of government spending, a shift from a balanced budget to a (small) deficit may temporarily reduce distortions especially if the distortions impact growth rather than output. Based on a consistent treatment of the government budget, the authors found evidence of a threshold effect at a level of the deficit around 1.5 percent of GDP. While there appeared to be a growth payoff to reducing deficits to level, this effect disappeared or reversed itself for further fiscal contraction. The magnitude of this payoff, but not its general character, necessarily depended on how changes in the deficit were financed (through changes in borrowing or seigniorage) and on how the change in the deficit was accommodated elsewhere in the budget. The authors also found evidence of the effects of interaction between deficits and debt stock, with high debt stocks exacerbating the adverse consequences of high deficits.

Nyong and Odubekan (2002) apply ordinary least squares estimation procedure to the effect that monetary financing of deficits leads to an increase in the money supply which affects inflation. The increase in inflation generates instability in the macro economy and hence poor economic growth due to the negative signal it sends to investors and savers. Saleh (2003) building on earlier studies on the impact of budget deficit on different economic variables, concludes that budget deficit has diverse impact on different economic variables. The range of the impact varies from country to country but could not ascertain the true impact on the economic growth. He applies the IS-LM model to explore the impact of budget deficit on different variables, including, interest rate, using simultaneous equations model for trade deficit and simple equation model to assess the impact on the GDP. He reports a positive and significant relationship between budget deficits and economic growth. Vit (2004) applies quarterly data on Czech Republic's economy over the period 1995 to 2002 to study the impact of deficit on the economy. He reports that budget deficits cause inflation and current account deficits, which subsequently impede economic growth.

Loizides and Vamvoukas (2005) apply the trivariate causality test to examine the relationship between government spending and economic growth, using data set on Greece, United Kingdom and Ireland. The study finds that government expenditure granger cause economic growth in all the countries. The finding was true for Ireland and the United Kingdom both in the long and short-run. The results also indicate that economic growth granger causes public expenditure for Greece and United Kingdom, when inflation is included.

Olowononi (2006) investigates the impact of budget deficit on selected macroeconomic variables in Nigeria. The results indicate that budget deficits had increasingly caused inflation in Nigeria. Budget deficit was also found to be negatively correlated with unemployment. The author concludes that the results corroborate the prescription of economic theory that rising budget deficit reduced unemployment. The author however, reports a negative relationship between budget deficits and gross capital formation and private investment in Nigeria. Bose, Haque and Osborn (2007) investigate the relationship between budget deficit and economic growth for 30 developing countries from 1970 to 1990 using panel data. The authors find that budget deficit impacts positively on output growth provided such deficit are applied in the productive expenditures such as education and health.

Olawumi and Tajudeen (2007) examine the contribution of fiscal policy in the achievement of sustainable economic growth in Nigeria using the Solow growth model and report that fiscal policy had not been effective in the area of promoting sustainable economic growth in Nigeria. They attribute the poor performance of

fiscal policy to the problems of policy inconsistencies, high level of corruption, wasteful spending, poor policy implementation and lack of feedback mechanism for implemented policies.

Aghion and Marinescu (2007), in analyzing cyclical budgetary policy and economic growth, apply yearly panel data on OECD countries to analyze the relationship between growth and the cyclicality of the budget deficit. Their result indicate that a more countercyclical budget deficit is positively correlated with growth. A coefficient of 0.11 of the lagged counter cyclicality of budget deficit means that if private credit to GDP is 0, then increasing the counter cyclicality of the budget deficit by one percentage point increases growth by 0.11 percentage point. For each percentage point increase in private credit to GDP, this positive effect of counter cyclicality diminishes by 0.0004.The effect of the interaction is thus small: private credit over GDP would need to be larger than 2.75 for a countercyclical budgetary policy to become growth-reducing. Thus, it is only at fairly high levels of financial development that countercyclical budgetary policy becomes noticeably less growth enhancing. Thus when the economy is on a decline, an increase in the budget deficit through public investment expenditure has a much greater effect on economic growth. In periods of economic boom, reductions in such expenditures have similar effect. At high level of financial development however, private sector credit is high and as such the effect of government expenditure is not as prominent as otherwise.

Obi and Nurudeen (2009) examine the effects of budget deficits and government debt on interest rates in Nigeria, by applying the Vector Auto-regression approach. The results of the estimation show that the explanatory variables account for approximately 73.6 percent variation in interest rate in Nigeria. The estimation also shows that budget deficits and government debt are statistically significant. For instance, a 1 percentage increase in government debt-GDP ratio raises interest rate by approximately 2.47 percent. The results indicate that budget deficits and government debt have positive impact on interest rates, while inflation and exchange rate were found to have negative effect on interest rates. The authors conclude that deficits financing leads to huge debt stock and tends to crowd-out private sector investment, by reducing the access of investors to adequate funds, thereby raising interest (and/or lending) rates. The rise in interest rate reduces investment demand and output of goods and services. These in turn reduce national income as well as employment rate, and the overall welfare of the people would decline.

Korsu (2009) investigates the effects of budget deficit on the external sector of Sierra Leone. The study utilized aggregate annual data from 1971 to 2005. Equations for

money supply, price level, real exchange rate and the overall balance of payments were estimated simultaneously, using Three Stage Least Squares (3SLS). Counterfactual policy simulation was then performed. The result shows that fiscal restraint improves the external sector of Sierra Leone by reducing money supply and the price level. The result also points to the need for a sustained reduction in the budget deficit of Sierra Leone as this helps in achieving monetary restraint and low price level, which has real exchange rate depreciation and improvement in the balance of payments as ultimate external sector benefits.

Korsu (2009) finding support the arguments of Jenkins (1997) and Mugume and Obwona (1998) who worked on data on Zimbabwe and Uganda, respectively. They argue that budget deficits are inimical to macroeconomic performance as a whole and advocated for fiscal restraint as a pathway to improving other sectors of the economy and welfare. Korsu (2009)'s work recognises economic growth, low and stable prices and healthy external balance as the macroeconomic policy objectives of the economy of Sierra Leone. These, he argues have been hampered by the persistence of budget deficits following some background analysis and historical records. To provide empirical support to the background information, aggregate annual data for the period 1971 to 2005 are used in an econometric estimation. Predicated on an open economy model, equations for money supply, price level, real exchange rate and the overall balance of payments were specified. The empirical models are estimated using a 3-stage least square estimation technique. The estimated results show that fiscal restraint improved the external sector of Sierra Leone by reducing money supply and the price level. The important contribution of Korsu's paper rests on the simulation experiments which differ from previous studies reviewed. The results point to the need for fiscal restraint and improved revenue generation to meet the expenditure requirements of the government.

Kumar and Soumya (2010) study the relationship between GDP growth and budget deficits taken as percentage of GDP to estimate a simple regression equation. The result yields a negative correlation, though a weak one, between GDP growth and budget deficit as a percentage of GDP. However, the long run relationship between budget deficit and GDP, using the logarithm of both variables to avoid non-stationary problem, is surprisingly positive.

Onwioduokit (2012) investigates the relationship between budget deficits and economic growth, as well as the threshold level of budget deficit in the West African Monetary Zone countries (The Gambia, Ghana, Guinea, Nigeria and Sierra Leone). The study explores the Ordinary Least Squares Technique (OLS) and the non—Linear Least Square (NLLS) methods for panel data estimations for the period 1980 to 2009. Two striking results are obtained: There exist a positive relationship between budget

deficit and economic growth in the WAMZ with a two year lag; and the threshold level of budget deficit conducive to economic growth for the WAMZ group was 5.0 per cent. The author concludes that the findings support the proposition that budget deficit beyond certain threshold was detrimental to growth in the Zone. The major recommendation from the study was that the Zone should raise the budget deficit/GDP criterion stipulated in the convergence criteria for eligibility to accede to the monetary union from 4.0 per cent to 5.0 per cent.

Most of the empirical studies on the relationship between budget deficit and economic growth are from the perspective of cross country analysis. The panel data methodology was widely adopted to investigate the relationship between series, by integrating time dimensions and various countries at a time. The results vary between various researchers. Some researchers including Barro (1991) Easterly et al (1992); Easterly et al (1993); Fischer (1993); Anusic (1993); Al-Khedar (1996), Hakkio's (1996); Jenkins (1997); Ghali (1998); Nyong and Odubekan (2002); Vit (2004); and Obi and Nurudeen (2009), found that the budget deficits do harm economic growth, while others including Barro (1979); Kormendi and Meguire (1985); Fischer (1993); Aschauer (1989); Mugume and Obwona (1998); Bahmani (1999); Saleh (2003); Bose, Haque and Osborn (2007); Aghion and Marinescu (2007); Kumar and Soumya (2010) find that budget deficit is positively related to output growth. Yet some researchers including Glannaros and Kolluri (1989) also report that there is no relationship between budget deficit and economic growth.

An additional important point that has emerged from the review is that the exact impact of deficit on economic growth is difficult to measure and that for any meaningful inference of policy relevance, a country specific study is required. Again, most of the existing empirical studies on the subject assume a linear relationship between deficits and growth, and even the two studies [Adams and Bevan (2002); and Onwioduokit (2012)] that assumed non linearity, and proceeded to estimate threshold are not country specific. From this point of view, this study will be the first to apply the threshold model in investigating the relationship between budget deficit and economic growth in Sierra Leone. Thus, the finding of this study will not just fill the identified gap in the literature for the studied Sierra Leone but will be of policy relevance.

3.0   ANALYTICAL FRAMEWORK AND EMPIRICAL METHODOLOGY
The analytical framework adopted for this study follows essentially the Keynesian framework as applied in Onwioduokit (2012), while the threshold methodology adopted follows Khan and Senhadji (2001). Recall that in a simple Keynesian framework, desired aggregate demand relationship is specified in the goods

market as: $Y = C + I + G + (X - M)$ (1)

With the following behavioural equations:

$$C = a + bY^d, \quad b > 0$$

$$Y^d = Y - T$$

$$I = d + gi, \quad g < 0$$

$$G = \bar{G}$$

$$X = s + Se, \quad S > 0$$

$$M = m + fY^d, \quad f > 0$$

Where Y is output; C, consumption; I, investment; G, government spending which is assumed to be exogenous; X, exports; M, imports; Y^d, disposable income; T, tax revenue; i, interest rate; e, exchange rate.

In equilibrium (after substituting behavioural equations into the desired aggregate demand equation (1)), output will be given by

$$\bar{Y} = \frac{A}{q} + \frac{1}{q}\big(gi + Se + G - (b - f\,T)\big) \qquad (2)$$

Where $q = 1 - b + f, \quad A = a + d + s - m$

From equation (2), increasing taxes will reduce output, while increasing government spending will increase output.

But Budget deficit (FD) is given by

$$FD = G - T \gg G - (b - f)T \qquad (3)$$

Budget deficit is the excess of government expenditure over its revenue. Assuming that the government derives its total revenue from tax sources (which is quite realistic), G-T gives the deficit position of the government. Since individuals do not spend all their income, the total revenue that could be generated from consumption expenditure is $(b - f)T$. Thus, subtracting this from government expenditure will give approximate position of the fiscal balance.

Putting (3) into (2) gives

$$\bar{Y} = \frac{A}{q} + \frac{1}{q}\big(gi + Se + FD\big) \qquad (4)$$

Given that Sierra Leone is essentially a small-open economies (without ability to influence international price developments) and for holistic treatment of the economy, the model is extended to incorporate the money sector as well as the

external sector. The money market in an open economy can be represented by the following equations:

Money Demand Function: $\dfrac{M^D}{P} = kY + l\,i,$ $\qquad\qquad k > 0,\ \ l < 0$ (5)

Money Supply Function: $\dfrac{M^S}{P} = m_1\dfrac{B}{P} + m_2 i,$ $\qquad\qquad m_1, m_2 > 0$ (6)

Equilibrium Condition: $\quad M^D = M^S$ $\qquad\qquad\qquad\qquad$ (7)

where P'' is the general price level,

$\qquad B''$ international reserves held by the central bank and m_1 $_{and}$ m_2 are coefficients.

From the above money market model, the LM schedule[6] can be specified as

LM Schedule: $\qquad\qquad i = y\dfrac{B}{P} + j\,Y,$ $\qquad\qquad y < 0,\ \ j > 0$ (8)

Given the importance of the external sector in Sierra Leone, the influence of the sector is incorporated through the balance of payments schedule. The balance of payments schedule is given as

BP Schedule: $B = A_2 - q_0 Y + q_1 e + q_2 i,$ $\qquad\qquad q_0, q_1, q_2 > 0$ (9)

where A_2 is the aggregate of exogenous components in the net export function and q_0, q_1, q_2 are coefficients.

Putting equation (8) into (3) gives

$$Y = A_1 + b_1\dfrac{B}{P} + b_2 Y + s\,e + FD \qquad\qquad\qquad\qquad (10)$$

Where $b_1 = \dfrac{yg}{q}$ and $b_2 = \dfrac{fg}{q}$

Putting equation (9) into (10) produces

$$Y = A_1 + \dfrac{b_1}{P}\left(A_2 - q_0 Y + q_1 e + q_2 i\right) + b_2 Y + s\,e + FD \qquad\qquad (11)$$

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[6] The LM curve is used to determined equilibrium in the money market. The L stands for liquidity and M for Money

Isolating like terms and re-arranging equation (11) gives

$$Y = C + \frac{1}{P}\left(a_1 e + a_2 i\right) + a_3 e + a_4 FD \tag{12}$$

Where $1 + b_1 q_0 - b_2 = j$, $\quad C = \dfrac{A_1 + b_1 A_2}{j}, \quad a_1 = \dfrac{b_1 q_1}{j}, \quad a_2 = \dfrac{b_1 q_1}{j}, \quad a_3 = \dfrac{s}{j}, \quad a_4 = \dfrac{1}{j}$

Recasting the second term on the right-hand side of equation (12) in logarithmic generic term gives:

$$Y = C + l\, e + a_2 i - p + a_4 FD \tag{12B}$$

where p " the rate of inflation and $l = a_1 + a_3$.

In equation (12B), equilibrium output is positively related to Budget deficit.

In a time series context, output is influenced by its own past level (output dynamics) which is consistent with accelerator principle. Equation (12B) can be restated as

$$Y_t = c + \vee Y_{t-1} + a_2 i_t + l\, e_t + a_4 FD_t - p \tag{13}$$

Recasting (13) gives

$$y_t = c + d_1 i_t + d_2 e_t + d_3 FD_t + d_4 p \tag{14}$$

where $\quad y_t = Y_t - Y_{t-1}$ which captures the change in GDP (growth rate of GDP) and $d_1, d_4 < 0$. Equation (14) is essentially an output (GDP) growth model which gives the long-run relationship between output growth (change in output) and Budget deficit. This relationship is positive; implying that widening of Budget deficit will improve growth. However, some empirical studies document the negative relationship between growth and Budget deficit, while some others establish a positive relationship as given by the simple Keynesian framework. This ambiguity of the relationship between growth and Budget deficit suggests a threshold effect of Budget deficit on growth. This will inform the empirical modelling of growth-deficit relationship in this study.

From the supply-side of the economy, output is a function of capital stock and labour. A simple Cob-Douglas production function generates a growth model of the form

$$y = w_0 + w_1 D \ln K + w_2 D \ln L \tag{15}$$

where K refers to capital stock, L refers to labour force growth, D is a change notation and w_0, w_1, w_2 are coefficients.

3.1   SPECIFICATION OF THRESHOLD MODEL

In specifying the empirical model, the study relies on the theoretical framework. From both the demand and supply sides of the economy, variables such as interest rate, exchange rate, inflation, Budget deficit, investment (change in capital stock) and labour are identified as the key variables explaining growth. However, it is appropriate to include in the empirical model those reform variables that also influence economic growth. In Sierra Leone, financial sector reforms have been undertaken, while trade liberalization policies have also been implemented. Hence, it is appropriate to include financial reforms variable and trade openness variable in the empirical model.

Based on the general framework provided, the key variables in the empirical model are defined as follows:

Dependent variable

Y_{it} = $GDPGt$ =   Growth rate of real GDP

INV_T =   Gross fixed capital formation as a ratio of GDP as a proxy for growth in capital stock

Lab =   Secondary school enrolment as a proxy for labour force

Def_t =   Secondary school enrolment as a proxy for labour force.

Inf_t =   Inflation rate

Inf_t =   Interest Rate = Lending Rate

M_2GDP_t=   M2/GDP ratio – measuring financial depth

Def_t = Exchange Rate expressed as a given amount of local currency per US dollar (Depreciation/ appreciation)

OPN_t =Degree of openness of the economy, measured as [(Imports + Exports/GDP]

Besides investment, labour force and Budget deficit; other control variables included in the model are, namely, interest rate (Int), exchange rate depreciation/ appreciation (dep), inflation (inf), financial deepening M2/GDP and openness index (OPN). Interest rate has an important role in economic growth. Higher interest rates reduce the growth of consumer spending and economic growth. This is because more incentive to save in a bank rather than spend, more expensive to borrow, therefore less spending on credit and less investment; increase cost of mortgage repayments, therefore, reduce disposable income and therefore consumer spending. Consequently, an inverse relationship is expected between interest rate and economic growth.

Exchange rate development impacts on the economic growth process. On balance, it is expected a positive relationship between depreciation and economic growth. Inflation is another significant variable influencing output growth rate. This variable is especially significant in Sierra Leone, where food price and other exogenous factors including high imports of food and intermediate products play very important role. In general, very high levels of inflation may undermine economic growth. However, if the inflation rate is low, stable and sustainable, it may be interpreted as an indicator of macroeconomic stability that would enhance growth. And if the economy is at equilibrium, higher inflation should impact adversely on growth. Hence, we expect to get inverse relationship with output growth.

Financial deepening measured by the ratio of M2 to GDP essentially seek to capture the role of the financial sector development in economic growth. The conventional theory predicts a positive correlation between the level of financial deepening and economic growth. In modern economic theory, the role of the financial sector is seen to be catalytic to the growth of the economy. Also, the index of openness proxied by the ratio of the sum of imports and export to GDP is expected to positively influence growth. All things being equal, the more open the economy, the more access to foreign capital that is expected to increase investment and economic growth. Thus, the level of openness of the economy is expected to positively impact on economic growth.

Budget deficit is another significant variable influencing output growth rate. This variable is especially significant for most developing countries including the Sierra Leone, where fiscal discipline plays very important role. In general, very high levels of Budget deficit may undermine economic growth. However, if the budget deficit is low, stable and sustainable, it may be interpreted as an increased demand for goods and services. And if the economy is below its equilibrium level of output, higher budget deficit, that is, increased government expenditures in virtue of Keynes, should stimulate growth. Consequently a positive relationship with output growth is expected.

The threshold model specifies that individual observations can fall into discrete classes based on the value of an observed threshold variable. Following the framework of Khan and Senhadji (2001); and Onwioduokit (2012), the threshold model is specified for the Sierra Leone as follows:

$$GDPG_t = \alpha_0 + \alpha_1 GDP_{t-1} + \alpha_2 Def_t[DM_t(Def_t < K^*)] + \alpha_3 Def_t[DM_t(Def_t > K^*)] + \alpha_4 INV_t + \alpha_5 inf_t + \alpha_6 int_t + \alpha_7 M2GDP_t + \alpha_8 Dep_t + \alpha_9 OPN_t + \alpha_{10} Labt + U_t$$

Where DM_t = Dummy variable with values 1 if $Def_t >$ K^* or 0 otherwise.

Def_t = Annual Budget deficit - GDP ratio

K^* = The threshold level of Budget deficit/GDP which is to be calculated.

a_2 = The effect of Budget deficit below the threshold level.

a_3 = The effect of Budget deficit above the threshold level.

Other variables are as previously defined.

All the variables are defined above. From the above equation, a priori expectations of a threshold effect of deficit on growth are that $a_2 > 0$, $a_3 < 0$. If threshold effect holds, then the turning point can be calculated using the relation[7.] $lnDef_t = \dfrac{a_2}{a_3}$ Taking the antilog of this will give optimal level of Budget deficit that will maximize real GDP growth.

3.2   DATA SOURCES AND ESTIMATION METHODOLOGY

GDP growth data, gross capital formation as well as secondary school enrolment data were obtained from the World Bank's World Development Indicators; Budget deficit data were obtained from the Ministries of Finance of Sierra Leone. Imports, Exports, Interest rates, exchange rate, and broad money growth data were sourced from the Bank of Sierra Leone, while inflation rates were obtained from the National Bureau of Statics of Sierra Leone. All variables are measured either in growth rate terms or as ratios. The study uses the non-Linear Least Square (NLLS) method as suggested by Khan et al. (2001).

The method involves the following procedures: for any K*, the model is estimated by OLS, yielding the Residual Sum of Squares (RSS) as a function of K*. The least square estimate is found by selecting the value of K* that minimizes the sum of squared residuals. An extensive and systematic analysis of the data was carried out. In particular, the stationarity test using Augmented Dickey Fuller (ADF) and the co-integration test, using Engle-Granger Two-Step procedure (EGTS) were applied. The use of EGTS is informed by the large number of the explanatory variables and the fact that not all the series are integrated at order one to warrant the use of the Johansson Technique.

$\frac{\partial GDP}{\partial Def} = a_2 + 2a_3 Def = 0; \; Def = \frac{a_2}{2a_3} = \frac{a_2}{2a_3}, when \; a_2 > 0, a_3 < 0$

3.3   DIAGNOSTIC TESTS FOR OPTIMAL LEVEL OF DEFICIT

After identifying the threshold level for deficit, it is important to determine whether the threshold effect is statistically significant. In this regard, this study conducted Normality Test (J-Qtest); Serial Correlation (LM test); Heteroscedasticity (ARCH) and Stability (Cusum square).

4.0   ANALYSIS OF RESULTS

The estimation of the model was done in various stages. We tested the data on the variables in the specification for unit root properties, having regard to Engle Granger's view that estimation of models using data that are not stationary has the potentials of yielding spurious regression results. Next, we estimated the model using the variables in the specification in the order in which they passed the unit root test. In the third stage of the estimation exercise, we tested for the existence of a cointegrating relationship among the variables in the specification by testing the residuals obtained from the third stage of the estimation exercise for stationarity. In the last stage of the exercise, we estimated the threshold model of the relationship between Budget deficit and output growth applying the range of between -1.0 percent and -10.0 percent.

4.1   UNIT ROOT TEST RESULTS

Essentially, we implemented both the Augmented Dickey-Fuller (ADF) and the Phillip-Perron (PP) tests for stationarity of the variables used in this study. The results are presented below.

Table 1: Sierra Leone ADF Unit Root Test Results

VARIABLE	ADF-STATISTIC AT LEVEL	ADF-STATISTIC AT 1ST DIFFERENCE	CONCLUSION
DEF	-2.967767**	-	I(0)
DEP	-3.580623**	-	I(0)
INF	-3.574244**	-	I(0)
INV	-4.309824*	-	I(0)
LENDR	-3.679322	-3.689194***	I(1)
M2GDP	-4.309824	-4.323979***	I(1)
OPEN	-3.612199**	-	I(0)
RGDPG	-1.952910**	-	I(0)

Source: Author's Computation   *** Significant at 1%, ** Significant at 5%, Significant at 10%

The results of the unit root tests (ADF) show that all the variables with the exception of (lending rate and broad money) passed the unit root test at conventional 10.0 percent level of significance in their levels. The two variables, however, passed the test for stationarity at 1st difference. The results obtained when the test for unit root

was conducted using variables in their first difference form are also reported in Table 1.

Table 2: Sierra Leone Phillip Perron Unit Root Test Results

VARIABLE	PP-STATISTIC AT LEVEL	PP-STATISTIC AT 1ST DIFFERENCE	CONCLUSION
DEF	-2.967767**	-	I(0)
DEP	-3.574244**	-	I(0)
INF	-3.574244**	-	I(0)
INV	-4.309824*	-	I(0)
LENDR	-3.679322	-3.689194***	I(1)
M2GDP	-4.309824	-4.323979***	I(1)
OPEN	-3.574244**	-	I(0)
RGDPG	-3.679322	-3.689194***	I(1)

Source: Author's Computation   *** Significant at 1%, ** Significant at 5%,* Significant at 10%

Investment, deficit, depreciation, inflation, real GDP growth rate and openness variables were stationary at levels, while lending rate and broad money as a ratio of GDP were stationary at first difference. Similar results were recorded when we applied the Phillip Person (PP) to test for the existence of unit roots in the variables (see Table 2)

IV.2   Co-integration Tests Analysis

Table 3: Sierra Leone Cointegration Test - Engel Granger First & Second Steps Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2GDP	-1.505390	0.441110	-3.412730	0.0020
C	47.63236	6.351386	7.499522	0.0000

Engle-Granger Second Step Results Null Hypothesis: RESID01 has a unit root

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.745226	0.0078
Test critical values:	1% level	-2.647120	
	5% level	-1.952910	
	10% level	-1.610011	

Source: Computed by the author

The ADF tests on the residuals at level (Table 3) confirm that the calculated ADF statistic (-2.745226) is greater (in absolute sense) than the tabulated critical value (-2.647120) at 1.0 percent level of significance. Thus, the null hypothesis of non-stationarity of the residuals is rejected. The apparent conclusion from these results is that the variables used in this study are co-integrated. That is, there is a stable long run relationship between them although there might be some deviations in the short run.

4.3   ANALYSIS OF ESTIMATION RESULTS FOR THE THRESHOLD MODEL

The estimation results, based on repeated estimation of the threshold model for the different values of expected threshold (K), are reported in Table 4. The first column labelled K, gives the range over which the search for the threshold is conducted. The dummy variable D1t represents the effect of deficit below the chosen threshold (K) value while G2t represents the effect of deficit above the threshold. Only the explanatory variables that are statistically significant are reported along with the deficit dummies to conserve space.

Table 4: Sierra Leone Threshold Model Results[8]

K	Variable	Coefficient	Std. Error	t-Statistic	Prob.	RSS	R^2
3%	D3*DEF	-0.602047	0.428548	1.404854	0.1854	344.43	0.672
	G3*DEF	5.292883	3.274741	-1.616275	0.1320		
	RGDPG(-1)	0.708356	0.169988	4.167100	0.0013		
	DEF(-1)	-1.203191	0.411766	-2.922025	0.0128		
	INF(-1)	-0.322624	0.094549	-3.412230	0.0052		
	DEP(-2)	0.415429	0.140323	2.960518	0.0119		
4%	D4*DEF	-0.751969	0.582630	1.290646	0.2211	441.58	0.58
	G4*DEF	1.097843	2.762660	0.397386	0.6981		
	RGDPG(-1)	0.760777	0.189887	4.006468	0.0017		
	DEF(-1)	-1.109921	0.482898	-2.298459	0.0403		
	INF(-1)	-0.296972	0.113235	-2.622618	0.0223		
	DEP(-2)	0.280969	0.136948	2.051640	0.0627		
5%	D5*DEF	-0.792895	0.543775	1.458131	0.1705	435.41	0.59
	G5*DEF	0.802732	1.397114	0.574565	0.5762		
	RGDPG(-1)	0.764401	0.188750	4.049803	0.0016		
	DEF(-1)	-1.095727	0.454929	-2.408564	0.0330		
	INF(-1)	-0.299040	0.107284	-2.787373	0.0164		
	DEP(-2)	0.300060	0.140444	2.136508	0.0539		
6%	D6*DEF	-0.767288	0.554049	1.384873	0.1913	440.44	0.58
	G6*DEF	1.011968	1.432758	0.706308	0.4935		
	DEF(-1)	-1.084967	0.460726	-2.354909	0.0364		
	INF(-1)	-0.298864	0.110744	-2.698685	0.0194		
	DEP(-2)	0.288530	0.138696	2.080310	0.0596		

7%	D7*DEF	-0.659884	0.147213	4.482513	0.0020	19.34	0.98
	G7*DEF	1.297777	0.368463	3.522136	0.0078		
	RGDPG(-1)	0.488093	0.062911	7.758452	0.0001		
	RGDPG(-2)	-0.498793	0.045134	-11.05142	0.0000		
	M2GDP	0.626480	0.302256	2.072681	0.0719		
	OPEN	0.529421	0.077886	6.797400	0.0001		
	DEF(-1)	-1.403013	0.092920	-15.09911	0.0000		
	DEP(-1)	0.325677	0.038391	8.483156	0.0000		
	LENDR(-1)	-0.555736	0.101483	-5.476157	0.0006		
	M2GDP(-1)	1.026591	0.343141	2.991743	0.0173		
	DEP(-2)	0.366352	0.024897	14.71447	0.0000		
	INV(-2)	1.524335	0.298344	5.109313	0.0009		
	LENDR(-2)	0.620096	0.078804	7.868791	0.0000		
	OPEN(-2)	-0.397831	0.060889	-6.533745	0.0002		
8%	D8*DEF	-1.035420	0.431111	2.401746	0.0334	312.57	0.70
	G8*DEF	-2.350726	0.841315	2.794109	0.0162		
	RGDPG(-1)	0.651814	0.166927	3.904793	0.0021		
	RGDPG(-2)	-0.378206	0.183597	-2.059983	0.0618		
	DEF(-1)	-0.846547	0.402757	-2.101882	0.0574		
	INF(-1)	-0.214100	0.095030	-2.252973	0.0438		
	DEP(-2)	0.286232	0.114812	2.493037	0.0283		
9%	D9*DEF	-0.955809	0.526315	1.816040	0.0944	408.22	0.61
	G9*DEF	-1.464029	0.888367	1.648000	0.1253		
	RGDPG(-1)	0.680385	0.199144	3.416552	0.0051		
	DEF(-1)	-1.127354	0.444850	-2.534235	0.0262		
	INF(-1)	-0.283542	0.101495	-2.793652	0.0162		
	DEP(-2)	0.313785	0.134829	2.327279	0.0383		
10%	D10*DEF	0.550323	0.396097	1.389364	0.1900	448.99	0.57
	G10*DEF	0.682364	0.649899	1.049954	0.3144		
	RGDPG(-1)	0.765364	0.197301	3.879178	0.0022		
	DEF(-1)	-1.014176	0.450761	-2.249922	0.0440		
	INF(-1)	-0.264260	0.101757	-2.596980	0.0234		
	DEP(-2)	0.242626	0.124311	1.951772	0.0747		

Source: Computed by the Researcher

As shown in Table 4 the minimization of RSS occurs at the threshold point of 7.0 percent, where the RSS records the lowest value of 19.34. To further confirm the threshold effect, the adjusted R^2 from the estimation at 7.0 percent yields the highest value of 98.0 percent. A passing perusal of the Table 7 shows that the coefficient of deficit dummy at the threshold ($G2_t$), carries positive sign indicating that above 7.0 percent, the effect of deficit on growth may be positive. Conversely, the coefficient

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[8]*Due to the data generating process for Sierra Leone, the threshold dummy for the Budget deficit at 1.0 and 2.0 percent yielded identical matrix thus Git were zero. Hence 1.0 and 2.0 percentages level were excluded*

of deficit dummy D1t, representing effect of deficit below the threshold level possess negative sign, suggesting that, deficit level below 7.0 percent is detrimental to growth. Thus the threshold level of deficit for the Sierra Leone is identified at 7.0 percent. It should be noted that the two parameters are statistically significant at 1.0 percent.

Table 5 presents another fascinating finding of this study. The effects of deficit, précised by the signs of the coefficients of the deficit dummies are generally positive. The coefficients of the deficit dummy G21t, maintain positive values between 3 and 7.0 percent, indicating that deficit impacts positively on growth within the deficit range of 3 to 7.0 percent. The policy implication is that running a deficit beyond 7.0 percent will be detrimental to growth. Thus the range 3.0 and 7.0 percent provides the arena for a menu of policy preferences on deficit levels that would be consistent with economic growth in Sierra Leone.

Table 5: Sierra Leone Range of Budget deficit Conducive for Growth

K	D_{1t} = Effect of deficit below K		G_{2t} = Effect of deficit above K	
	Coefficient	**Effect**	**Coefficient**	Effect
3%	-0.602047	Negative	5.292883	**Positive**
4%	-0.751969	Negative	1.097843	**Positive**
5%	-0.792895	Negative	0.802732	**Positive**
6%	-0.767288	Negative	1.011968	**Positive**
7%	-0.659884	Negative	1.297777	**Positive**
8%	-1.035420	Negative	-2.35	**Negative**
9%	-0.955809	Negative	-1.464029	**Negative**
10%	-0.550323	Negative	-0.682364	**Negative**

Source: Computed by the Researcher

4.4   DIAGNOSTIC TESTS RESULTS

Diagnostic tests were carried out for the 7 percent threshold model. Diagnostic results for the optimal level of deficit are depicted in table 6.

Table 6: Sierra Leone Diagnostic Test Results at 7 Percent Threshold

TEST TYPE	STATISTIC	VALUE	PROBABILITY	REMARKS
Normality	Jarque Bera	3.722841	0.155452	Normally distributed residuals
Serial Correlation (LM)	F-statistic	3.163727	0.1235	No serial correlation
Heterescedasticity (ARCH)	F-statistic	0.675159	0.4190	No heteroscedasticity
Stability	Cusum squares	Within bands		Stable

Source: Computed by the Researcher

The residuals for all the estimated equation was found to be normally distributed and stable. No serial correlation and heteroscedasticity were observed in the equation, implying that the estimates are reliable and accordingly, can be relied on for policy indication.

5.0   CONCLUSIONS AND RECOMMENDATIONS

This paper has sought to identify the budget deficit threshold that is consistent with economic growth in Sierra Leone. The threshold level of budget deficit conducive to economic growth for Sierra Leone was identified at 7.0 percent. Consequently, the level of Budget deficit beyond 7.0 percent is inhibitive of economic growth in Sierra Leone.

On the policy front, this paper has provided ample evidence in support of the proposition that Budget deficit beyond certain threshold is detrimental to growth. This suggests that the Sierra Leonean authorities should endeavour to reduce Budget deficits to 7.0 per cent (levels consistent with economic growth). Even so, these results are tentative having regard to weaknesses in data and limitations to econometric framework adopted. In any event, the study presents a useful prognosis of sustainable path of future budget deficits in Sierra Leone.

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