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Econometric Analysis of Fiscal Deficit Sustainability of Ghana

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Abstract
The paper examined the sustainability of fiscal policy in Ghana over the period of 1980-2010, to determine whether or not the economy has achieved the feat as a criterion required for membership in proposed West African Monetary Zone (WAMZ). Using error correction method of analysis, the study revealed that the variables have long run relationship which indicated sustainability, although weak, which shows an indication that the country might not qualify for membership in WAMZ. Also, the study reveals that only 29 percent of disequilibrium between government revenue and expenditure generated in the economy was restored yearly following shocks to the economy. The study therefore recommends that government should improve on her tax revenue generation and other source of income and ensure records of surplus budgeting.
Keywords: sustainability, criterion, economy, fiscal deficit, error correction
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1. Introduction

One of the prerequisites for a successful formulation of monetary union in any region is that the prospective member countries should share similar characteristics in term of fiscal and monetary policies e.g. single digit inflation rates, single digit interest rate, regulated exchange rates, economic growth policy and so on, so that it would not be a union of unequal partnership Oyeleke, (2013). The contemporary example for forming currency unions is the European Monetary Union (EMU). Membership in EMU requires that the prospective country should comply with a set of strictly defined criteria. Other unions have emulated EMU, adopting the same view that those characteristics are necessary to form strong monetary union and create convergence criteria similar to EMU. The rationale behind the Euro area convergence criteria appears to be the measure of macroeconomic soundness of each country vying for membership in the union.

West Africa Monetary Zone (WAMZ) comprises six countries, namely; The Gambia, Ghana, Guinea, Liberia, Nigeria, and Sierra Leone. Under "Convergence, Stability, Growth and Solidarity Pact" adopted by Heads of States and Governments in 2000, the criteria set for eligible country to join WAMZ include price stability, sustainable fiscal deficit, limited deficit financing by the central bank of each country and maintaining of desirable levels of foreign exchange reserves. Fiscal sustainability analysis has, therefore, become an important component of macroeconomic health analysis of each prospective country in WAMZ. This emanates from the fact that the usefulness of annual budgetary balances and the official public debt figures for analysing the medium-term and long-term soundness of public finances has gradually gone into extinction.

Fiscal sustainability of the government policies exists if the implementation of the government programmes does not threaten the solvency of a country now or in the future. Meanwhile, solvency requires that the current and future expenditures and income are reduced into a common denominator (Adam, Ferririni and Park 2010), or the financial capacity of the government to service its debt obligations in perpetuity without being explicitly defaulted. The issues surrounding fiscal deficits as well as national debts are certainly not new, but the achievement of monetary integration; establishing a common central bank and common currency, requires that each country's fiscal deficit should be sustainable. Moreover, an important fact is that threats to fiscal sustainability have serious implications for macroeconomic growth and financial stability of each country as well.

Unsustainable deficit adversely affect the macroeconomic performance; retard the smooth operation of private sector, generates economic instability and poor economic growth which could necessitate policy change. However, frequent changes in policies are thus a natural cause of poor economic performance. Therefore, the issue of fiscal deficit sustainability is an important prerequisite that must be satisfied by each prospective country of WAMZ to be eligible for inclusion in the monetary union. WAMZ was formally launched by the Heads of State and Government of The Gambia, Ghana, Guinea, Nigeria and Sierra Leone, in December 2000, with the objective of establishing a common central bank and introducing a single currency by 2003, later postponed to 2005 and 2009 respectively Akande, Adewuyi and Adeoye (2007).

Trend Analyses of Government Revenue, Expenditure and Fiscal Deficit

Table 1 presents trend of Government Revenue, Government Expenditure and Fiscal Deficit in Ghana's

economy from 1980 to 2010

Table 1: Trends of Gov. Revenue, Gov. Expenditure and Fiscal Deficit in Ghana (%GDP)

YEAR	GOV. REVENUE	GOV. EXP.	FISCAL DEFICIT
1980	4.14	11.19	-7.05
1981	5.51	16.29	-10.79
1982	5.21	9.14	-3.93
1983	9.47	14.04	-4.57
1984	8.19	10.37	-2.18
1985	9.70	12.06	-2.36
1986	13.50	16.32	-2.82
1987	12.10	13.85	-1.75
1988	11.55	13.57	-2.02
1989	11.90	13.41	-1.50
1990	8.38	11.85	-3.46
1991	8.98	11.34	-2.36
1992	7.38	14.44	-7.06
1993	10.97	19.79	-8.81
1994	13.18	21.71	-8.54
1995	15.78	24.22	-8.44
1996	12.36	22.53	-10.17
1997	9.35	19.20	-9.85
1998	10.13	18.33	-8.20
1999	8.26	16.81	-8.54
2000	13.42	20.1	-6.68
2001	17.90	23.08	-5.18
2002	12.73	17.11	-4.38
2003	17.02	20.37	-3.35
2004	17.56	20.54	-3.03
2005	16.69	19.53	-2.84
2006	17.06	21.77	_4.71
2007	17.5	23.09	-5.59
2008	16.04	24.51	-8.48
2009	16.52	22.35	-5.82
2010	16.81	24.02	-8.25

Source: World Economic Outlooks (WEO), IMF (2012)

Table 1 revealed that the Government Expenditure outstripped Government Revenue generated by Ghana's successive governments throughout the entire periods, 1980-2010. In 1980, for instance, the government revenue was 4.1 per cent of GDP. It could be observed that the deficit had increased by factor of ten before the decade ran out. In year 2000, the deficit of Ghana economy was 6.67 per cent of the total monetary value of all economic activities in the country. Oshikoya and Tarawalie (2010) emphasised that "Ghana's fiscal position remained weak, informed by persistent fiscal deficits". The authors argued that Government expenditure accelerated between 1980 and 2008 due to huge expenditure outlay, especially on wages and salaries. However, they submitted that the adoption of the Economic Recovery Programme in the mid 1980's helped lessened the effects of increase in government spending in the economy of Ghana.

Ghana's government, in attempt to play a central role of achieving economic and social objectives including macroeconomic stability, sustainable growth and poverty reduction, actually got enormous budget deficit. But, in recent times, the deficit position of Ghana and other African developing countries has degenerated, thereby drawing attention to its long term sustainability (Doh- Nani and Awunyo-Vitor 2012). Therefore, this study investigated fiscal deficit sustainability of Ghana economy between1980 to 2010, as a prerequisite for prospective membership in WAMZ and that this work is different from others in term of method of cointegration analysis and objective. The rest of this paper is divided into review of literature section, data source and the methodology, estimation and results, and finally, summary and conclusion.

2. Review of Literature

Oshikoya and Tarawalie (2010) investigated sustainability of fiscal policy of West African Monetary Zone (WAMZ) countries between 1980 and 2008. The main focus of their study was to empirically assess the sustainability of fiscal policy in the countries of the WAMZ, using annual time series data. The present value

budget constraint provided the methodology for them to analyse fiscal sustainability in a cointegrating framework that accommodated both stationary and non-stationary variables. Granger causality test was also employed. The result revealed that fiscal policy was weakly sustainable for all the countries exceptSierra Leone, whose fiscal policy was found to be unsustainable. However, the authors did not confirm furtherthrough the method of error correction or coefficient restriction test the statistical value of the slope coefficient obtained from cointigrated analysis. Also, the study used Johansen cointegration method which did not allow for testing for statistical restriction of the coefficient through which strong or weak sustainability could only be determined. Akande, Adewuyi and Adeoye (2007), investigated the challenges of meeting macroeconomic convergence criteria in second West Africa Monetary Zone; Nigeria as a case study, having established the cointegration of the revenue and expenditure for Nigeria, Ghana and Sierra Leone, they found that out of four primary criteria, only the price stability target appeared not to have been met by Nigeria. With respect to secondary criteria, the result of the analysis showed that the success rate in the achievement of the targets established was mixed. Precisely, Nigeria has not been able to raise the level of tax revenue as a percentage of GDP to 20 percent. The study did not investigate further through another method of analysis like error correction model to proffer solution to the results obtained in respect of Ghana's economy.

Lusinyan and Thornton (2009) examined the issue of long-run fiscal sustainability in South Africa. They used recently developed unit root and co-integration tests to real revenue and spending data for the period 1895 to 2005. The results provided evidence that, allowing for structural breaks, South African revenue and spending during this period were I(1) series and cointegrated, with the estimated long-run equilibrium relation supporting the presence of a weak deficit sustainability condition. However, the authors did to examine the short run relationship between government revenue and expenditure in South Africa through error correction method of analysis as a sufficient condition to establish sustainability and only through which speed of adjustment could be determined.

Afonso (2000), using econometric approach, found that the alternative hypothesis of a co-integration between government revenue and expenditure should be rejected for most EU15 countries. In addition, for the three countries for which the existence of a co-integration vector between revenue and expenditure could not be excluded, the expenditure coefficients were smaller than 1, suggesting that for these countries fiscal policies might be unsustainable. However, the study did not conduct further analysis to establish the significance of the coefficient, using method of error correction. Other studies that have investigated fiscal policy sustainability for different countries include Budina and van Wijnbergen (2001) examined fiscal for Turkey, Bascand and Razin (1997) for Indonesia, Schoeman (2005) for South Africa and so on.

Hye and Mashkoor(2010) estimated aggregate import demand function for Bangladesh economy by using the data of 1980 to 2008. They provided the evidence of investigation by using autoregressive distributed lag (ADRL) approach to cointegration and rolling window regression method to estimate the coefficient of each observation in the sample by fixing the window size. Their estimation result confirmed long run relationship between imports, relative price and economic activity, and long run economic growth elasticity was positive significant but relative price elasticity in the long run was negative and insignificant statistically. However , the results of rolling window method demonstrated that the long run elasticities of national income variable were vary in the range of 0.81 to 0.96 and the relative price elasticities were negative according to the theory except few years.

Adams, Ferrarini, and Park (2010), in the light of the renewed significance of Asia fiscal sustainability in the post-crisis period, carried out three types of empirical analysis. The first one used analysis of the actual state of public finances, looking at the key fiscal indicators across the Asia. The second analysis employed econometric test of fiscal sustainability, in particular estimations of fiscal policy reaction functions that measured the response of primary fiscal balances to changes in debt ratios in Asian countries and over time. Lastly the third study used fiscal simulations that assessed the effect of the anti-crisis fiscal stimulus on debt sustainability in the region. In those three analyses, they found that the overall balance of evidence from the first two types of analysis indicates that, though, there was considerable heterogeneity across the region. The studies concluded that the public finances in the region were in good shape i.e. they were fiscally sustainable. These studies and many other have investigated fiscal deficit/policy at different time for different countries.

Data Sources

The study employed annual data series on government revenue, government expenditure and fiscal deficit (all as a ratio of Ghana's GDP) for the period 1980 to 2010. The data was obtained from World Economic Outlook (WEO) data, IMF 2012. The use of annual data is informed by the available frequency of the data for the variables. Also, the choice of study period is so significant in the Ghana's history, being the period that witnessed political transformations.

Variables Description

The main variables employed in the study include government revenue, government expenditure and fiscal deficit (all as a ratio of GDP). The reason being that as the economy grows, government expenditure and government revenue grow as well proportional to GDP. These variables are relevant to the study as changes in government spending or revenue brought about changes in fiscal deficits (Doh-Nani and Awunyo-Vitor 2012)

3. Methodology

Sustainability Criteria

The most straightforward path to assessing the fiscal deficit sustainability position is to begin from inter-temporal government budget constraint. This budget constraint, like individual or household budget constraint analysed in the theory of price, looks at the long-run relationship between government revenue and expenditure which covers the total government spending on goods and services, transfer payments and interest on debts (Jibao, Schoeman and Naraidoo 2012). Following Jibao, Schoeman and Naraidoo (2012), we assume that bonds financing is chosen to finance budget deficits with a maturity of one period. This implies that the government faces the budget constraint as shown in equation one:

$G_t + (1+ r_t)B_{t-1} = R_t + B_t$ .....(1)

Where G is government expenditure, r is the one-period real rate of interest, R is government revenue and B is the stock of debt. Iterating equation (1) forward yields the government's inter-temporal budget constraint:

$G_t - R_t = \sum_{j=0}^{\infty} \prod_{i=1} (1 + r_t)^{-j+1}(R_{t+j} - G\_t) + lim_{j\to 0} \prod_{i=1}^{\infty} (1 + r_{t+1})B_{t+j}$.....(2)

Where $(1+r)^{-j+1}$ is the discounting factor while R_{t+j} and G_{t+j} are differences of government revenues and expenditure respectively. It is assumed that the real interest rate is stationary with unconditional mean given by r_t and also the growth rates of real supply of bond, on average, are equal to or lower than the average rate of interest (Jibao, Schoeman and Naraidoo 2012). With these assumptions, we have the following expression:

$lim_{j\to 0}(1 + r_{t+1})B_{t+j} = 0$ .....(3)

Equation (3) states that the debt stock, when discounted to present value terms, vanishes in the limit. By definition, it excludes Ponzi financing; i.e. the government is not 'bubble'-financing its spending by issuing new debt to finance the deficit. This is analogous to saying that the deficit is sustainable if and only if the stock of debt held by the government is expected to rise no faster than the average real rate of interest, which is viewed as a proxy for the growth rate of the economy (Jibao, Schoeman and Naraidoo 2012). Given equation (3), the inter-temporal government budget constraint, equation (2), can be rewritten:

$G_t - R_t = \sum_{j=0}^{\infty}(1 + r)^{-j+1}(\Delta R_{t+j} \Delta G_t + r B_{t+j})$ ..... (4)

The inter-temporal government budget constraint, under the No-Ponzi scheme rule, imposes certain restrictions on the time series properties of government expenditure and revenue given at the right hand side of equation (2). It must be stationary as long as government expenditure, revenue and the stock of debt are all stationary in first differences. Specifically, if (G_t) and R_t are I(1), they will be cointegrated, implying that there exists an error-correction mechanism pushing government finances towards the levels required by the inter-temporal budget constraint (Jibao, Schoeman and Naraidoo 2012). Consequently, equation (4) can be rewritten as

$G_t = \alpha + R_t + \lim \frac{B_{t+j}}{(1+r)^{j+i}} + \varepsilon_t$..... (5)

Equation (5) forms the basis for testing the hypothesis of sustainability of fiscal deficit. If the tranversality condition for the budget constraint holds and the limit term in (5) is zero, we obtain the equation below;

$R_t = \alpha + \beta G_t + \varepsilon_t$ ..... (6)

along with the null hypothesis of $\beta = 1$ and ε_t is a stationary process (Quintos 1995 and Lau, Tiong and Ling 2009). From the above, R_t is the government revenue, α is a constant parameter, β represents the slope of the equation, G_t is the government expenditure and ε_t is the error term of the model.

According to Quintos (1995), the deficit is strongly sustainable if and only if the I(1) process of R and G are cointegrated and $\beta = 1$. The deficit is only weakly sustainable if R and G are cointegrated and $0 < \beta < 1$ while fiscal policy is not sustainable if $\beta = 0$. He argued that $0 < \beta < 1$ satisfied both necessary and sufficient conditions of fiscal deficit sustainability. Therefore, to test for sustainability or otherwise of the fiscal policy in Ghana, this study, for cointegration test, used Engle-Granger 2-step procedure. Engle-Granger 2-step procedure test for cointegration is employed because it is widely accepted as a reliable test for causality between two or more variables. Also, this test estimates long-run models using Ordinary Least Squares (OLS) which provides reliable coefficients of the model (Doh-Nani, 2011) and it affords us the opportunity to determine the statistical value of the slope coefficient through restriction coefficient test, upon this, strong or weak sustainability can only be determined. Applying the Engle-Granger 2-step procedure, long run cointegration relation between government revenue and government expenditure (all as ratio of GDP) series are estimated, using OLS technique

to estimate the equation (7) below. Taking first differencing of both sides, equation (6) becomes;
$\Delta(GREV_t) = \alpha + \beta\Delta(GEXP_t) + \varepsilon_t$ ..... (7)
Take the variables as stated above.

Quintos (1995) suggested that it is imperative to test the linear restriction of the coefficient of the independent variable(s) for statistical significance. A linear coefficient restriction test for statistical significance of the cointegrating vector β was performed which means, we tested whether the coefficient of the independent variable in the long-run cointegration model was statistically different from 1. It should, however, be noted that the value of β needes not necessarily be 1 in absolute terms, but in statistical terms.

Following Lusinyan and Thornton (2009), the short-run nexus between government revenue and expenditure of Ghana were estimated using error correction model (ECM). It should be noted that if cointegration relationship exists between government revenue and government expenditure, there is always a presence of corresponding error correction representation (Doh-Nani 2011). The process assisted in ascertaining the cointegrating relationship between the variables of interest as change in government revenue did not only depend on change in the government expenditure and its own past values, but also on the extent of disequilibrium between the levels of both variables. Therefore, this study used the first difference of the variables. Equation (7) was hereby specified in error-correction model of the form;
$\Delta(GREV_t) = \alpha + \beta\Delta(GEXP_t) + \pi\Delta(ECM_{-1}) + \varepsilon_t$ .....(8)

$\Delta(GREV_t)$ is the first difference of government revenue, $\Delta(GEXP_t)$ is the first difference of government expenditure and $\Delta(ECM_{-1})$ is the first error correction model generated from the residuals estimated in equation (7). Π was the coefficient of the error correction term which incorporated feedback in the relationship between revenue and expenditure. In another word, the coefficient of the error correction term represents speed of adjustment to long run equilibrium following shocks to the system. Hence, it captured the transitional dynamics of the system to the long-run equilibrium (Goh-Nani 2011).

Specification and Estimation Techniques

In this study, the estimation process involves the following steps: (i) testing for stationarity of the variables; (ii) testing for the cointegrating relationship; (iii) estimating and evaluating of the error correction model coefficient to determine the speed of adjustment or how fast government revenue catches up with the government expenditure in economy of Ghana. This will provide us with information on eligibility of Ghana to WAMZ membership. In this case, first, we carried out two different tests for the order of integration of the variables, which are: the Augmented Dickey-Fuller(1981) and the Phillips-Perron (1988) tests. The Augmented Dickey-Fuller and Phillips-Perron tests have as their null hypothesis that the dynamics of the respective series are characterised by a unit root. We chose those cointegration tests that are most popular among economics scholars: Engle-Granger 2-step procedure (1987) which is residual based. That is, we first estimate the cointegration regression as specified in equation (7) using ordinary least squared (OLS) and second, test for the presence of a unit root in the residuals generated from the regression of OLS.

Results of the Analyses

Table 2: Unit Root Test Result

GHANA	ADF		PHILLIP-PERRON		
SERIES	LEVELS	1st Diff	LEVELS	1st Diff	Integ. Ord.
GREV.(Constant)	-2.259	-6.520*	-2.167	-6.691*	I(1)
(Constant Linear)	-3.451	-6.429*	-3.451	-6.597*	
GEXP. (Constant)	-1.944	-7.842*	-1.812	-7.829*	I(1)
(Constant & Linear)	-3.615**	-7.712*	-3.615**	-7.701*	

Note: (*) (**) indicates rejection of the null hypothesis of non-stationary at 1 and 5 percent significance level based on the MacKinnon critical values.

Table 2 revealed that there was presence of unit roots in government revenue and government expenditure (all as ratio of GDP) series at levels. However, it indicated stationarity after first difference. Therefore, we concluded that all the variables were stationary and integrated of order one.

Cointegration Results:

Table 3: Engel-Granger 2-StepCointegration (OLS)

Dependent Variable: ΔGREV

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔGEXP	0.695596	0.097443	7.138485	0.0000
C	-0.166756	1.776076	-0.093890	0.9258
R-squared	0.637309			

Source: Author's Computation

Table 3 presented the OLS of first step of Engel-Granger 2-step cointegration procedure. Having established that government revenue and expenditure were integrated of the first order i.e. I(1), we, therefore, continued to assess the potential long run relationship (cointegration) between government revenue and government expenditure. In this case, we tested whether government revenue and expenditure were cointegrated. This was because stationarity of the variables of interest had satisfied the prerequisite and primary condition of using the econometric technique for the analysis. Therefore, we invoked the sufficient condition of testing for sustainability through cointegration process, by applying Engle-Granger 2-step procedure of cointegration.

Table 4 Unit Root in Residuals Test

Series	ADF	PHILLIP-PERRON	
RESID. (Constant)	-2.643093*	-2.538840*	I(0)
(Constant & Linear)	-2.532804*	-2.513298*	

*indicates rejection of the null hypothesis of non-stationary at 10% significance level based on the MacKinnon critical values. Source: Author's Computation

After we have run the OLS regression of equation (7), the result was presented in table 3. Then we tested for the presence of unit roots in the residuals obtained from the OLS regression and the result was displayed in Table 4. According to Brooks C (2008), expressing the residuals as the linear combination of the variables, government revenue and government expenditure are integrated of order (1) i.e. linear combination of I(1) variables, then, the residuals should be I(0). By implication, using Engle-Granger 2-step cointegration, the residuals generated from the OLS regression result of linear combination of I(1) variables, must be stationary at levels i.e. I(0). We used Augmented Dickey Fuller and Phillip-Perron tests of unit roots and the null hypothesis of presence of unit root in the residuals was rejected, which implied the existence of cointegration of the variables of our interest. Thus, long run relationship existed between government revenue and expenditure in Ghana economy (sustainability) between the periods under review. The result showed that the fiscal deficit of Ghana was sustainable over the period.

Table 5 Wald Coefficient Restriction Test

Equation	Coefficient	F-stat	S-Error	t-statistic	Prob.	H_0
$\Delta(GREV)=f\Delta(GEXP)$	0.304404	9.758811∗	0.097443	3.123910	0.0000	β=1

∗ indicates rejection of null hypothesis at 1% significance level
Source: Author's Computation

Table 5 presented the result obtained from Wald statistical coefficient restriction test in line with Quintos(1995)'s argument. We tested whether the sustainability that existed in Ghana between1980 to 2010 was either weak or strong sustainability through statistical coefficient restriction test. The coefficient value (β) obtained from the result was statistically less than one at 1 percent level of significance which indicated that Ghana fiscal deficit was weakly sustainable over the period under consideration.

Short Run Analysis

Error Correction Results:

$$(\Delta GREV) = 0.157 + 0.615(\Delta GEXP) - 0.288(ECM(\_1)$$
$$(0.3071) \quad (0.0983) \quad (0.1246)$$

Standard errors in parenthesis

Source: Author's Computation

The error correction result, under short run analysis, presented the conventional negative sign. However, the slope (0.288) of the error correction term was insignificant. By implication, although the series of government revenue and government expenditure in Ghana economy between 1980 and 2010 moved together in the long run, but the coefficient of error correction term was statistically insignificant, meaning that the speed of adjustment of government revenue variable was slow to catch up with government expenditure over time. Accordingly, with the estimated coefficient of -0.29 from error correction model, it suggested that 29 percent of disequilibrium between government revenue and expenditure generated in the economy was restored yearly following shocks to the economy and that there was a slow rate of convergence toward equilibrium. Based on this result, we concluded that Ghana's fiscal policy was weakly sustainable and slow in adjustment. This suggested that, the governments of Ghana, over the past three decades, have not put in place the best policies to enthrone fiscal deficit sustainability, a prerequisite for membership in proposed West African Monetary Union like European Union.

4. Summary and Conclusion

The study investigated whether or not Ghana has fulfilled the criterion of fiscal deficit sustainability as a precondition for membership in West African Monetary Zone, being proposed to establish common currency in the region. Given the results obtained, the study concluded that Ghana's fiscal policy was weakly sustainable within the period analysed which may deprive her of a membership in the proposed West African Monetary Union. Also, based on economy performance, it is not feasible for government of Ghana to continue generating stable debt-to-GDP ratio indefinitely. On this note, Ghana's government cannot continue to finance its debt which accumulates from budget deficit without necessary adjustments to her yearly budget; otherwise, the revenue capacity of the country would not be able to support her expenditure in the long run. Furthermore, to avert a situation which may call for sudden fiscal policies change which are inimical to economic stability, growth and development of the country, the government needs to do more in the areas of growth enhancing policy formulation and implementation; strict adherence to budget implementation and evasion from extra budgetary activities in attempt to reduce her expenditures.

REFERENCES

Adams C, Ferrarini B, and Park D (2010), Fiscal Sustainability in Developing Asia , No. 205, ADB Economics Working Paper Series, 1-48

Afonso, Antonio, (2000) 'Fiscal policy sustainability: some unpleasant European evidence', ISEG Working Papers, Department of Economics, Technical University of Lisbon, WP 2000/12.

Agbawali Francis (2011) Critical Analysis of the Impact of Government Expenditure and Money Supply on Inflation Rate on the Economy of Ghana. Being an M.Sc Thesis Submitted to Maastricht School of Management (MSM) Maastricht, The Netherlands.

Akande T, Adewuyi A. O and Adeoye B.W. (2007) Meeting the Challenges of Macroeconomic Convergence Criteria in the Second West Africa Monetary Zone (WAMZ); the Case of Nigeria *Nigerian Institute of Social and Economic Research (NISER) 2007*

Ariyo Ademola (1993) Assessment of Fiscal Deficit Sustainability in Nigeria, 1970-1990. *Journal of African Economy.*Vol. 2, 262-282

Brooks C (2008) Introductory Econometrics for Finance (2nd Edition), Cambridge University Press, The Edinburgh Building, Cambridge CB2 8RU, UK. ISBN 978-0-521-69468-1

Budina Nina and Sweder van Wijnbergen (2008) Quantitative Approaches to Fiscal Sustainability Analysis: A Case Study of Turkey since the Crisis of 2001. *The World Bank Economic Review*, 1-22.

Doh-Nani Richard (2011) Is Ghana's Budget Deficit Sustainable? A Cointegration Analysis. An M. Sc Thesis Presented to the Department of Economics, Kwame Nkrumah University of Science and Technology, Ghana

Richard Doh-Nani, Dadson Awunyo-Vitor (2012) "The Causal Link between Government Expenditure and Government Revenue in Ghana", Asian Economic and Financial Review, Vol. 2, No. 2, 382-388.

Engle, R. F. and Granger, C. W. J. (1987) Co-Integration and Error Correction: Representation, Estimation and Testing, *Econometrica* 55, 251-276

Johansen, S. and Juselius, K.,(1990).Maximum likelihood estimation and inference in cointegration with application to the demand for money. *Oxford Bulletin of Economics and Statistics*, vol.52, 169-210

Lusinyan and Thornton (2009) 'The sustainability of South African fiscal policy; an historical perspective', *Applied Economics*, No.41: Vol. 7, 859-868

Mehdi and Reza (2011) Relationship Between Government Budget Deficits and Inflation in the Iran's Economy. Journal of Information Management and Business Review, Vol. 2, No.5, 223-228

Oshikoya, W. T andTarawalie A (2010) Sustainability of Fiscal Policy: The West African Monetary Zone (WAMZ) Experience. *Journal of Monetary and Economic Integration*, Vol. 9, No.2, 1-29

Oyeleke O. J (2013) Analysis of Fiscal Policy Sustainability in West African Monetary Zone Countries (1980-2010). M, Sc thesis Submitted to the Department of Economics, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

Phillips, P.C.B. and Perron, P. 1988. Testing for the Unit Root in Time Series Regression .*Biometrika*, 75: 335-346.

Quintos, E. Carmela (1995).Sustainability of the Fiscal Process with a Structural Shifts *Journal of Business and Economic Statistics,* Vol. 13, No 4, 409-417

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