International Journal of Advanced Research and Development
ISSN: 2455-4030
Impact Factor: RJIF 5.24
www.advancedjournal.com
Volume 2; Issue 5; September 2017; Page No. 168-169

Impact of government domestic borrowing on interest rate

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Abstract
Using data from 2007-2011, the study examined the relationship between interest rate, inflation and domestic debts using linear regression method. The results revealed that (57%) of the variation in interest/lending rate can be explained by domestic debts and at an alpha level of 0.05, the researchers failed to reject the H1 and conclude that there is a significance relationship between debts and interest/lending rates. It was concluded that sixty four percent (64%) of the variation in inflation can be accounted for by domestic debts. This conclusion was made base on the R-Square. The researchers further therefore failed to reject the H2 and conclude that there is a relationship between inflation and domestic debts. It is recommended that there should be an improvement in public finances in other to generate a surplus on recurrent operations and also Government must be cognizant of the use of domestic credit by the statutory bodies.

Keywords: interest rate, domestic borrowing, inflation

1. Introduction
Ghana has long depended on aid and other loans to support its development. This saw its debt rise steadily over the years. When the IMF and World Bank introduced the Heavily-Indebted Poor Countries (HIPC) initiative in 1999, Ghana was refereed to be a HIPC with debt which was not sustainable. The country profited from debt relief under the initiative in 2004 when the country qualify for other policy conditions. Public debt is one of the major economic policy concerns confronting the governments of poor countries globally. The debt levels, mainly amongst the Highly Indebted Poor Countries (HIPCs), and Low-Income Countries (LICs) in general, have for a long time raised major concerns among international financial institutions and bilateral lenders, bringing about in several initiatives from the developed countries and from the international financial institutions to ease the debt burden that was threatening to cripple the economies of HIPCs (Abbas et al, 2010) [1]. Countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than in advanced economies. As long as they use the borrowed funds for productive investment and they do not suffer from macroeconomic instability, policies that distort economic incentives, or sizable adverse shocks, growth should increase and allow for timely debt repayments (Pattillo *et al*. 2004). Correct use of debt could lead to improved socio-economic growth and thus, better standards of living. In order to make debt effective, there is need for far reaching reforms in the management of the public sector. However in most cases, resources from debt have not been used as effectively, for example, projects financed by international loans have, due to lack of adequate or realistic planning, failed to generate sufficient resources to service the debt borrowed. Therefore socio-economic development is conceded since the government spends huge sums on loan repayments, hence reducing money it spends on education, health and other social amenities, which mainly target the poor, who comprise the majority of the population (Kendren, 2009).

The debates near the exact relationship between public sector deficits or government debt and interest rates motivated this study. Easterly and Schmidt-Hebbel (1993) argued that the relationship between fiscal deficits (government debt) and interest rates is a complex one because countries finance their deficits in different ways. On the one hand, under a repressed financial sector, taxes on financial assets are a major source of revenue for the government. On the other hand, in a liberalized financial system, where the government finances its deficits via domestic borrowing, public sector will compete with the private sector for loans. This puts upward pressure on interest rates. The World Bank (1993) [12] opined that in economies where financial markets are not repressed, higher deficits/borrowing financed by domestic debt increase domestic real interest rates when external borrowing is not possible. However, if financial markets are integrated with world capital markets, higher domestic borrowing results in international capital inflows and higher foreign debt. Thus the impact on domestic real interest rates will not be much. Moreover, in countries where the financial markets are repressed (that is, interest rate control, compulsory public debt placements, and controls on external capital flows), given a fixed nominal interest rate fiscal deficits raise inflation, resulting in a repressed (even negative) real interest rates (World Bank, 1993) [12]. Given the above notion, the researchers tried to find the exact relationship between government debts (domestic borrowing) on the interest rate.

2. Literature Review

2.1 Interest Rate Theories

Anyanwu (1990) explicated the following interest rate theories: (a) the classical theory, (b) the loanable funds theory, (c) the Keynesian theory and (d) the modern theory of interest or the Hicks-Hanson IS - LM Model. According to Pandey (1999), "interest rates can either be nominal or real. Nominal interest rate can be measured in naira terms, not in terms of goods. The nominal interest rate measures the yield in cedi per year, per cedi invested while the real interest rate is corrected for inflation and is calculated as the nominal interest rate minus the rate of inflation". Again, interest rate is the price of money that is the amount of interest paid per unit of time expressed as a percentage of the amount borrowed. The cost of borrowing money, measured in cedis, per year per cedis, borrowed, is the interest rate and that interest rates differ mainly in term/maturity that is the length of time for repayment and liquidity that is quick conversion of assets to funds. Once maturity and liquidity together with other factors are considered, many different financial instruments and so many different interest rates will emerge (Anyanwu, 1997).

2.2 The Loanable Funds Theory

This is a flow theory that determines the interest rate by the interaction of demand for and supply of loanable funds or credit and involves the linking of the interest rate with non-saving, investment and hoarding of funds sourced from government, businessmen and consumers, on the demand side with saving, dishoarding and bank money on the supply side from private individuals and corporate bodies. It is asserted that the loanable funds theory like the classical and the Keynesian theories of interest are indeterminate unless the income level is already known.

2.3 Debt and Interest rate

Much controversy surrounds the quantitative effects of government debt and deficits on long-term real interest rates. Economic theory provides different answers depending on issues such as whether deficits reflect changes in government expenditures or shifts in the timing of taxes, and on the planning horizon of households who hold government debt and pay taxes. One might hope that empirical evidence could be brought to bear on this question, but here the results are just as ambiguous. One major obstacle in obtaining empirical estimates is the need to isolate the effects of fiscal policy from the many other factors affecting interest rates. The most obvious of these factors is the state of the business cycle. If automatic fiscal stabilizers raise deficits during recessions, while at the same time long-term interest rates fall due to monetary easing, deficits and interest rates may be negatively correlated even if the partial effect of deficits on interest rates controlling for all other influences is positive. Higher interest rates caused by expanding government debt can reduce investment, inhibit interest-sensitive durable consumption expenditures, and decrease the value of assets held by households, thus indirectly dampening consumption expenditures through a wealth effect. The magnitude of these potential adverse consequences depends on the degree to which federal debt actually raises interest rates. A standard benchmark for understanding and calibrating the potential effect of changes in government debt on interest rates is a standard model based on an aggregate production function for the economy in which government debt replaces, or "crowds out," productive physical capital (Council of Economic Advisers 2003; Ball and Mankiw 1995). McCallum (1984) discussed that factors other than government debt can influence the determination of interest rates in credit markets. For example, in a growing economy, the monetary authority will purchase some government debt in order to expand the money supply and try to keep prices relatively constant Government debt held by the central bank does not crowd out private capital formation, but many empirical studies of federal government debt and interest rates ignore central bank purchases of government debt. Different surveys over the past twenty years have evaluated the empirical literature on the relationship between federal government debt and interest rates: Barth, Iden, and Russek (1984), Bernheim (1987, 1989), Barro (1989), Barth, Iden, Russek, and Wohar (1991), Seater (1993), Elmendorf and Mankiw (1999), and Gale and Orszag (2002, 2003), for example. In discussing empirical research on federal government debt and interest rates, Elmendorf and Mankiw (1999) state that: "…it is worth noting that this literature has typically supported the Ricardian view that budget deficits have no effect on interest rates." However, they go on to evaluate this evidence, writing: "Our view is that this literature, like the literature regarding the effect of fiscal policy on consumption, is ultimately not very informative. Examined carefully, the results are simply too hard to". Gale and Orszag (2002) in their survey of the economic effects of federal government debt also acknowledge that the evidence from the literature as a whole is mixed", but go on to conclude: "Closer examination of the literature, however, suggests the findings may not be as ambiguous as they initially appear. Indeed, studies that (properly) incorporate deficit expectations in addition to current deficits tend to find economically and statistically significant connections between anticipated deficits and current long-term interest rates."

3. Methodology

The study adopted a quantitative approach. The researchers used annualized five years annualized data that is from the period of 2007-2011. For convenience sake, the researchers used convenient sampling. These entailed the review of already existing literature from recognized journals, reports, publications, newspapers and articles that carried information on debts, interest rate and Treasury bill rate. Secondary data were collected for this study. The data on debts was per annum secondary data over the periods of 2007 and 2011. The interest rate was also an annual data as well and was based on the monetary policy rate (MPR). All data were taken from bank of Ghana as well as other sources. A simple linear regression model was used. Linear regression attempts to model the relationship between two variables by fitting a linear equation to observed data.

The hypotheses for the study are;

H1: There is a significant difference relationship between interest rates and domestic debts

H2: There is a significant difference relationship between inflation and domestic debts

The model specification is as below;

$CRt = \beta 0 + \beta 1Dt + \mu_t$ 1

$CF_t = \beta 0 + \beta 1D_t + \mu_t$ 2

C is the dependent variable, D is the explanatory variable

μ is the error term. For model 1, CR is the interest rate. In model 2, CF is the inflation.

D is the domestic debt.

4.1 Inflation

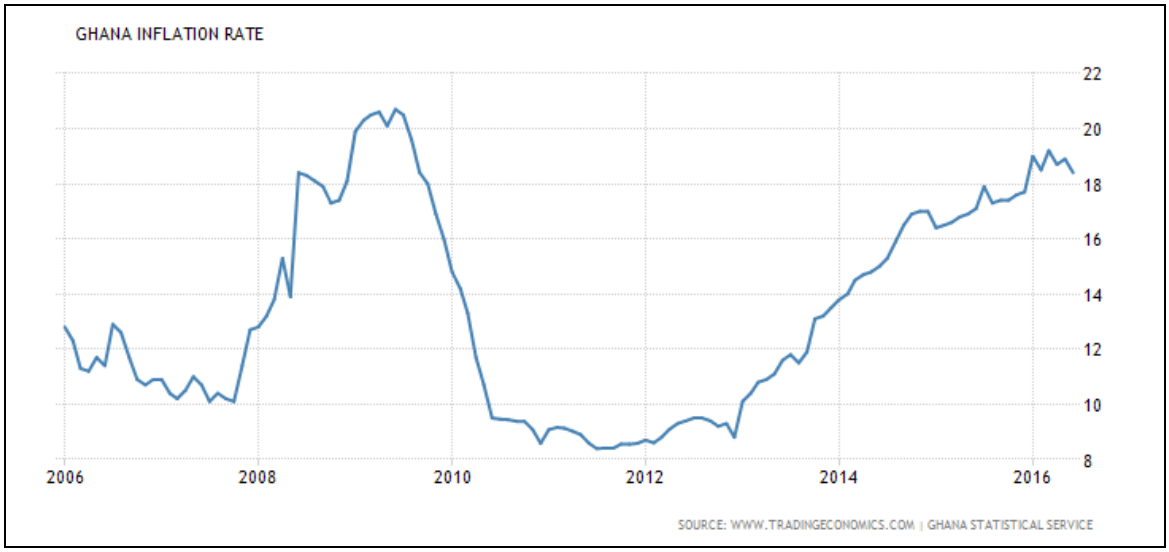

Fig 1

In Ghana, the most important components in the Consumer Price Index (CPI) are Food and Non-Alcoholic Beverages (43.6 percent of total weight); Housing, Water, Electricity, Gas and Other Utilities (9.5 percent) and Clothing and Footwear (8.9 percent). Transport account for 7.2 percent of total index, Miscellaneous Goods and Services for 7 percent, Hotels, Cafés and Restaurants for 6 percent and Furnishing and Household Equipment for 4.6 percent. Education represents 3.8 percent of total weight, Recreation and Culture another 2.7 percent and Communication 2.6 percent. Health accounts for the remaining 2.4 percent and Alcoholic Beverages, Tobacco and Narcotics 1.6 percent. The figure above provides Ghana inflation Rate actual values and historical data. From the data, we can see that the inflation has been rising steadily until its stared falling in 2009 and then begin to rise again from 2012 upwards. Other contributors to the rise: clothing and footwear (22.6 percent from 22.8 percent); recreation and culture (27.4 percent from 27.9 percent); furnishings and household items (21.4 percent from 21.8 percent); education (33.3 percent from 32.3 percent); miscellaneous goods and services (15.5 percent from 15.4 percent); health (13.9 percent from 13.9 percent); hotels, cafes and restaurants (14.9 percent from 14.4 percent and communication from 12.5 percent to 13.3 percent.

From the Inflation data that was used for the research, we can see that it also rise steadily and later falls. As domestic debt increases, inflation also increases steadily. However, the inflation later falls. A low and stable inflation rate uplifts the poor and vulnerable citizens and gives a nurturing environment for economic growth.

4. Data Analysis and Discussion

From the data that was used for the analysis, we see that the debts have been increasing at an increasing level. The debts are in millions of Ghana Cedis. The debts span from 3705 through to 11481. Within a period of just five years, we can see that the debts rose steadily.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.805[a]	.649	.532	3.07722
a. Predictors: (Constant), Debt				

From the model summary, we say that sixty four percent (64%) of the variation in inflation can be explained or accounted for by domestic debts. This conclusion was made base on the R-Square. The R-squared is a statistical measure of how close the data are to the fitted regression line. It is also known as the coefficient of determination, or the coefficient of multiple determinations for multiple regressions. Again, drawing inference from the Anova, the researchers conclude that at a significance of .1 and looking at it from and alpha level of 0. 05, the researchers therefore failed to reject the H2 and conclude that there is a relationship between inflation and domestic debts. The inference was drawn from the table below.

Table 2: ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	52.440	1	52.440	5.538	.100[b]
Residual	28.408	3	9.469		
Total	80.848	4			
a. Dependent Variable: Inflation					

4.2 Domestic Debts

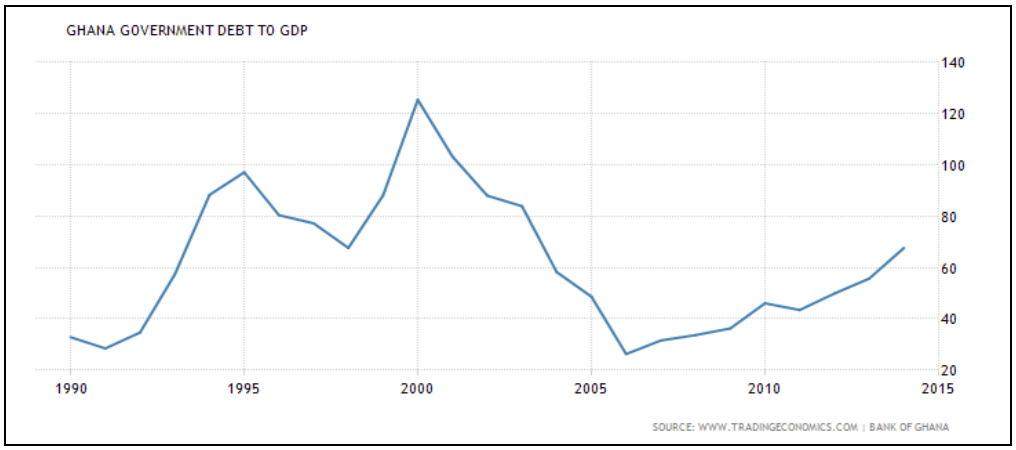

Fig 2

Generally, Government debt as a percent of GDP is used by investors to measure a country ability to make future payments on its debt, thus affecting the country borrowing costs and government bond yields. This page provides the latest reported value for - Ghana Government Debt to GDP - plus previous releases, historical high and low, short-term forecast and long-term prediction, economic calendar, survey consensus and news. Ghana Government Debt to GDP - actual data, historical chart is presented above. From the figure above, debts to GDP has been risen since 1990 through to 2000 and then stared falling and the rise again upwards. Borrowing from the central bank has no direct cost but carries a serious risk of inflation due to excess aggregate demand caused by an increase in money supply. Therefore, if the government borrows directly from central bank, it is alike to printing money. It is a very inflationary approach and is not usually encouraged. Domestic debt is an important ingredient of inflation. It has been observed that, in developed and emerging countries the problem is not the domestic debt but the cost of domestic debt in the determination of the inflation rate. Domestic debt with low interest rates is an important factor in the determination of price level through the inter-temporal budget valuation. On the other hand, high interest rates have a strong impact on high or hyper inflationary periods in emerging countries. The inflationary spirals which had been experienced by many emerging countries could be explained by the cost of domestic debt. Countries experiencing inflationary periods follow interest rate policies resulting from tight money policies, which increase domestic borrowing even further; decreasing maturity and increasing budget deficits. During the process, further rises in interest payments amplify domestic debt stock. The following works confirm this study.

The works of Bildirici and Ersin (2007) [9] which examine the relation between domestic debt and inflation for those countries that have high inflation support this study. Their findings show that the cost of domestic debt increases on account of inflation. Accordingly, the swelling debt to GDP ratios caused these countries to borrow at higher cost and with low maturity. Again, the work of Kannan and Singh (2009) also support this research. Their study trace out policy conduct and stability of public debt in India by capturing the dynamic interaction of deficits and debt with macroeconomic variables such as inflation, interest rate, trade gap and output by applying a 2SLS simulation technique for the period of 1971 to 2006. The study finds that fiscal deficits and debt have an adverse impact on all the macroeconomic variables under consideration in the medium to long run.

4.3 Interest/Lending Rates

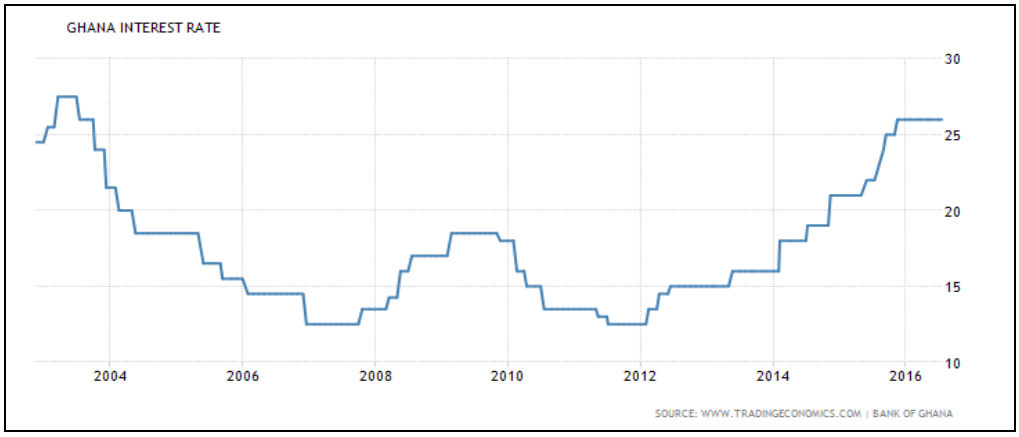

Fig 3

In Ghana, interest rates decisions are taken by the Monetary Policy Committee of the Bank of Ghana. The official interest rate is the Monetary Policy Rate (MPR). This page provides Ghana Interest Rate, actual values, historical data, forecast, chart, statistics, economic calendar and news. Ghana Interest Rate, actual data, historical chart is depicted by the figure above.

Table 3: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.239[a]	.570	.427	3.41256
a. Predictors: (Constant), Debt			

From the model and the regression output we can say that fifty seven percent (57%) of the variation in interest/lending rate can be explained by domestic debts. Looking at the Anova table below and focusing on the significance level .69 and at an alpha level of 0.05, the researchers failed to reject the H1 and conclude that there is a significance relationship between debts and interest/lending rates.

Table 4: ANOVA[a]

Model	Sum-of Squares	Df	Mean Square	F	Sig.
Regression	2.125	1	2.125	.182	.698[b]
Residual	34.937	3	11.646		
Total	37.062	4			
a. Dependent Variable: Lending					
b. Predictors: (Constant), Debt					

We therefore can conclude that domestic debt do affect interest/lending rate and that there is a relationship between these two variables (interest/lending rates and domestic debts).The studies below are in support of this study. The results of the study show that government debt has a negative and significant impact on interest rates, price level and output. Wheeler (1999) study also support this researcher when he attempted to investigate the macroeconomic impacts of government debt in US by applying variance decompositions and impulse response functions for the period of the 1980s and 1990s. The author tests the Ricardian Equivalence hypothesis by examining the impact of government debt on output, price level and interest rates. Wheeler results of the study show that government debt has a negative and significant impact on interest rates, price level and output. The findings as presented above are supported by previous studies (Bildirici and Ersin, 2007 [9]; Obi and Nurudeen, 2009; Kannan and Singh, 2009). For example, a study by Obi and Nurudeen (2009) found that fiscal deficits and government debt have a positive impact on interest rates. The authors suggest that the government should increase the revenues and should decrease unnecessary spending. Kannan and Singh (2009) also found that fiscal deficits and debt have an adverse impact on all the macroeconomic variables under consideration in the medium to long run. The findings of the study by Bildirici and Ersin (2007) [9] shows that the cost of domestic debt increases on account of inflation. Accordingly, the swelling debt to GDP ratios caused these countries to borrow at higher cost and with low maturity.

5. Conclusion

Domestic Public Debt is mainly debt owed to holders of Government securities such as Treasury Bills and Treasury Bonds. Governments usually borrow by issuing securities, government bonds and bills. Governments borrow for two reasons namely: when the projected revenue targets fall short of the projected expenditure and to pay off maturing loans (Ponzi games) which is typical with domestic debt (Babu, *et al.*, 2015). Domestic debt may have positive as well as negative impacts on economic growth "Reasonable" levels of borrowing by a developing country are likely to enhance its economic growth, both through capital accumulation and productivity growth. Countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than in advanced economies. As long as they use the borrowed funds for productive investment and they do not suffer from macroeconomic instability, policies that distort economic incentives, or sizable adverse shocks, growth should increase and allow for timely debt repayments (Pattillo et al. 2004).

Domestic debt financing leads to crowding-out of private investment. When issuing domestic debt, governments tap domestic private savings that would otherwise be available to private sector. This is normally followed by an increase in domestic interest rates, if these are flexible, adversely affecting private investment. However, even when interest rates are controlled, domestic borrowing can lead to credit rationing and crowding-out of private sector investment (Fischer and Easterly, 1990). Once a country borrows, it has to pay the loan amount plus interest and associated cost (Debt servicing). This will therefore imply that the government uses resources which could be used to meet its expenditures to pay the debt. Debt service has crowded-out funding for social and capital expenditures in these countries. After debt servicing and salaries, there is little left for core functions of the government, that is, education, health, basic infrastructure, and other essential services to create an enabling environment for the private sector (Kiringai, 2002). According to IMF (2001), extensive use of domestic borrowing can have severe repercussions on the economy. Domestic debt service can consume a significant part of government revenues, especially given that domestic interest rates are higher than foreign ones. The interest cost of domestic borrowing can rise quickly along with increases in the outstanding stock of debt, especially in shallow financial markets. The increase in interest rates may be even more pronounced if the investor base is relatively narrow, since the government may be held hostage by a particular group of investors. The main objective of this study is to specifically examine the relationship between domestic debt and interest/lending rate in Ghana from 2007-2011. Linear regression method was used to establish a simple relationship between the variables under study. The results revealed that fifty seven percent (57%) of the variation in interest/lending rate can be explained by domestic debts and at an alpha level of 0.05, the researchers failed to reject the H1 and conclude that there is a significance relationship between debts and interest/lending rates. It can be concluded that sixty four percent (64%) of the variation in inflation can be explained or accounted for by domestic debts. This conclusion was made base on the R-Square. The researchers further

therefore failed to reject the H2 and conclude that there is a relationship between inflation and domestic debts at an alpha level of 0.05.

6. References

1. Abbas A, Belhocine N, ElGanainy A, Horton M. A historical public debt database. IMF Working Papers. 2010, 10/245.
2. Abbas Ali, Jakob Christensen. The Role of Domestic Debt Markets in Economic Growth: An Empirical Investigation for Low-income Countries and Emerging Markets, 2007. *IMF WP 07/127*
3. Adèr HJ, Mellenbergh GJ. Advising on research methods: a consultant's companion. Johannes van Kessel Publishing, Huizen, 2008.
4. Adofu I, Abula M. Domestic Debt and the Nigerian Economy. Current Research Journal of Economic Theory. 2010; 2(1):22-26.
5. Alison J. Key Issues for Analyzing Domestic Debt Sustainability Debt Relief International, 2001 Publication. 2001; 5.
6. Alison J. Key Issues for Analyzing Domestic Debt Sustainability. Debt Relief International Publication, 2010. ISBN: 1-903971-07-1.
7. Allen S. Financial Risk Management: A practitioners guide to managing market and credit risk USA (New Jersey) John Wiley and sons, 2003.
8. Anyanwu JC. An econometric investigation of determinants of foreign direct investment in Nigeria. In Annual Conference, Nigeria Economic Society, 1998.
9. Bildirici M, Ersin OO. Domestic Debt, Inflation and Economic Crises in Developing Countries. Journal of Applied Econometrics and International Development. 2007, 7-1
10. Buiter WH. Death, birth, productivity growth and debt neutrality. The Economic Journal. 1988; 98(391):279-293.
11. Checherita Cristina, Rother Philipp. The impact of high and growing government debt on economic growth an empirical investigation for the euro area. Working Paper Series No. 2010, 1237.
12. Christensen J. Domestic Debt Markets in sub-Sahara Africa. IMF Working Paper, WP/06/46 World Bank Policy Research Bulletin. 1993, 2004; 4(3).
13. Christensen Jakob. Domestic Debt Markets in Sub-Saharan Africa. IMF Staff Papers. 2007; 52(3):518-538.
14. Dai Q, Philippon T. Government deficits and interest rates: a no-arbitrage structural VAR approach, 2004.
15. Kemal AR. Debt Accumulation and Its Implications for Growth and Poverty. The Pakistan Development Review. 2001; 40(4).
16. Komain J, Brahmasrene T. The Relationship between Government Expenditures and Economic Growth in Thailand. Journal of Economics and Economic Education Research, 2007. [http://findarticles.com/p/articles/mi_qa5529/?tag=content; col1] (last visited: 5-6-2016)
17. Laubach T. The Effects of Budget Deficits on Interest Rates: A Review of Ltd. 2004, 247-274.
18. Maana, Isaya, *et al*. Domestic Debt and its Impact on the economy – The case of Kenya paper presented during the 13th Annual African Econometric Society Conference in Pretoria, South Africa, 2008.
19. Modigiliani F. Long Run Implications of Alternative Fiscal Policies and the Burden of National Debt. Economic Journal. 1961; 71:730-55.
20. Oshadami OL. The Impact of Domestic Debt on Nigeria's Economic Growth. Unpublished B. Sc Project, Department of Economics, Kogi State University, Anyigba, 2006.
21. Oshadami OL. The Impact of Domestic Debt on Nigeria's Economic Growth, Unpublished M.Sc Thesis, Department of Economics, Imo State University, 2006.
22. Saunders MN, Saunders M, Lewis P, Thornhill A. Research methods for business students, *5/e*. Pearson Education India, 2011.
23. Schclarek A. Debt and Economic Growth in Developing Industrial Countries, mimeo, 2004. available on-line http://www.nek.lu.se/publications/workpap/Papers/WP05_34.pdf.
24. Shapiro DM. Federal Government Debt and Interest Rates, in "Discussion of Engen and Hubbard, NBER Macroeconomics Annual Conference, 2004.
25. Singh charan. Domestic Debt and Economic Growth in India. Economic and Political Weekly. 1999; 34(23):1445-1453.
26. Uzochwkwus, Amakom. Nigeria Public Debt and Economic Growth: An empirical Assessment of Effects on Poverty. African Institute for Applied Economics Enugu Nigeria, 2003.