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DOMESTIC DEBT AND INFLATION IN GHANA

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Abstract

It is common knowledge that the drawback in the use of domestic debt is the crowding out effect syndrome on private investment. The impact breeds rise in interest rate which encourages inflation. This may not be case in all situations as company specifics may dictate otherwise both in the short and long terms. This study x-rays the effect of domestic debt on price level stability in Ghana. The study was carried out in the context of panel study for three African countries of Ghana, Nigeria and Egypt; the motive is to determine the nexus between domestic debt and economic performance. The methodology used is the PMG-ARDL model by Pesaran & Smith (1999). The variables used are Inflation, domestic debt, Broad money supply, interest rate, credit to the private sector and government capital expenditure. The software package is E-views 11. The result shows that domestic debt is associated with reduction in inflation contrary to common expectation. This result is in tandem with the analysis if the trends of domestic debt and inflation for the period under review.

Introduction

Ghana's debt has been on the steady increase over the years such that when World Bank and IMF introduced the HIPC (highly indebted poor country) initiative in 1999, Ghana was readily referred to as HIPC with debt acclaimed to be unsustainable. She benefited eventually from the debt relief package in 2004. The debt levels of HIPC and LICs (low income countries) have raised major concerns for global financial institutions and bilateral lenders. If the borrowed funds were used for productive ventures and in the absence of macroeconomic instability or sizeable adverse shocks, growth should be enhanced and timely debt repayment made feasible. The correct use of debt could lead to improved

socioeconomic growth and thus better standards of living. Ghana has relied heavily on aid and other loans to support its development needs.

Global shocks do occur and tend to have contagion effect on low income economies. Many countries made conscious efforts to reduce the weight of foreign debt in their public debt portfolio. Ghana also relies heavily on export revenues from cocoa, agricultural products and gold mineral. The prices of commodities are determined globally and vagaries in weather could trigger production shortfalls. The misuse of borrowed funds leads to shortfalls in socioeconomic development as government spends huge sums of money on loan repayments. This reduces the money spent on education, health and other pro poor social amenities which are of immense benefits to the majority of the population (Kendren, 2009). The debate on the exact relationship between public sector deficits and price level stability (proxies by inflation rate) motivated this study. The interaction of inflation with the domestic funding component of public debt is our special area of interest. The World Bank (1993) posits that in economies where financial markets do not suffer from repression, borrowings financed through domestic debt, leads to increase in real interest rates especially with non-availability of external borrowings. The result tends to be different if financial markets are integrated with the world capital as higher domestic borrowings result in international capital inflows.

The impact on domestic real interest rates will be minimized. However, where there is interest rate control, compulsory public debt placements and controls on external capital inflows – these are significant signs of repression of financial markets – fiscal deficits will raise inflation given a fixed nominal interest rate. The result is often a repressed or even negative interest rate. The causes of public debt in Ghana have been attributed to fiscal dominance, deterioration in export earnings, ineffective debt and fiscal management policies. These are factors that bring changes in the total debt stock. Figure 1a below depicts Ghana's debt/GDP ratio and domestic debt stock over time. It shows a steady noticeable increase in use of domestic funding. The effect of domestic debt on inflation is not very apparent and scanty studies on same have recorded contradictory results. Bruno and Easterly (1998) reported that inflation has a negative effect on growth. The cost of domestic debt increases with inflation; the increasing debt/GDP ratios lead these countries to borrow at higher cost and with lower maturity. The increasing cost of borrowing stems from the application of non Ricardian policies. Figures 1b and 1c capture the inflation rate and interest rate respectively. The striking similarity in behaviour pattern of both rates from 2010 is remarkable! As government domestic debt stock grows, inflation and interest rates rise as well.

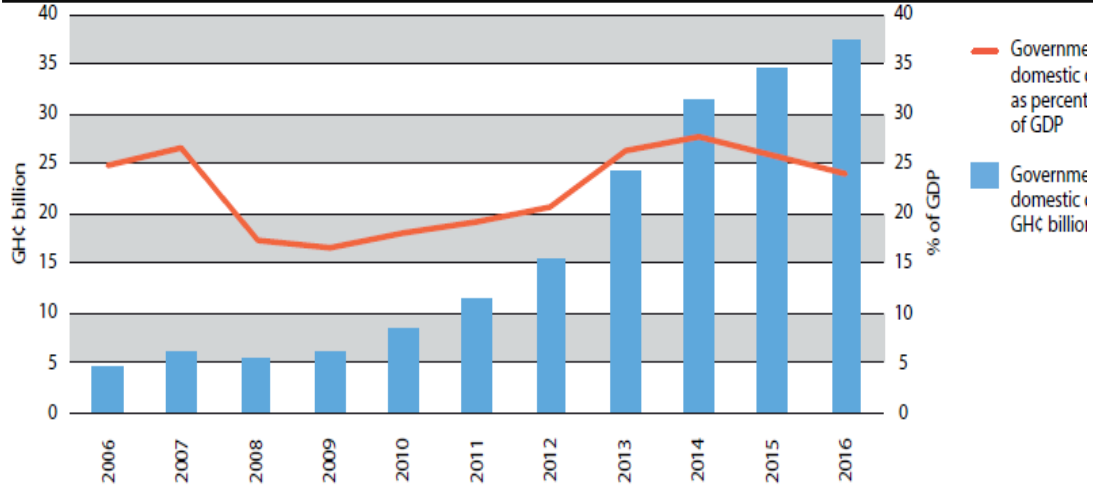


Figure 1a: Ghana's domestic debt profile (2006 – 2016)

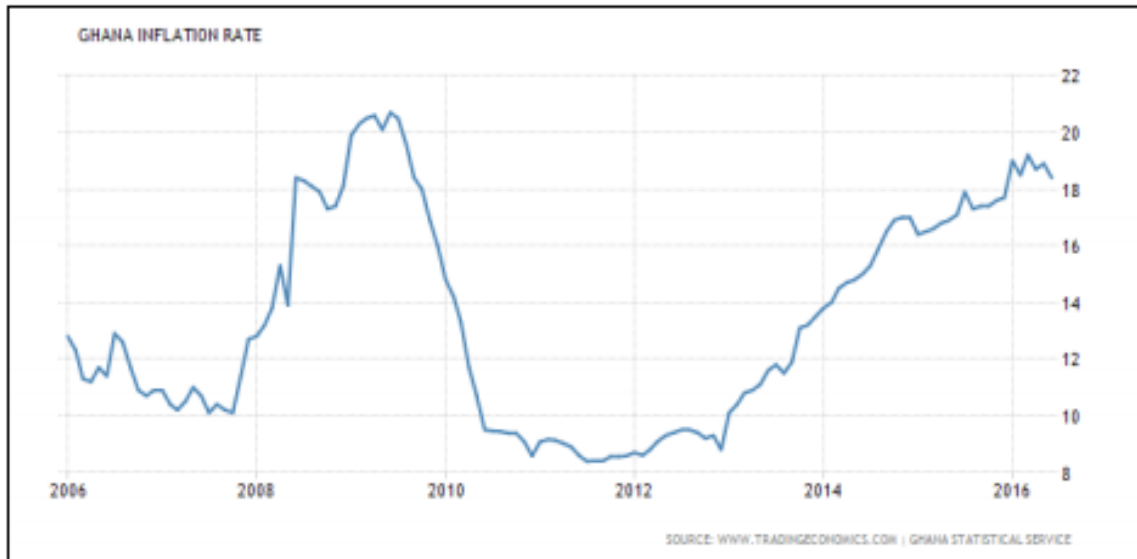


Figure 1b: Ghana's inflation rate (2006/2016).



Figure 1c: Interest rates for Ghana (2004-2016).

Typically higher inflation results from strong economic growth. If aggregate demand in an economy expands faster than aggregate supply, one would expect a rise in inflation rate. The fall in unemployment puts upward pressure on wages which leads to higher inflation. Many studies affirm that domestic debt has positive impact on economic growth - an integral part of the macroeconomic 'trilemma'. The crowding out effect has always been fingered by critics and admirers of domestic funding. It follows by extension that domestic debt promotes inflation through the channel of interest rate hike on private sector borrowers. Such rise in cost of capital will trigger the cost plus inflation type and ultimately leads to rise in prices of goods in the economy. This study investigates the impact of domestic debt stock on the general price level in the economy of Ghana.

The hypothesis of interest which is stated in the null form (H_0) is that there is no significant relationship between domestic debt and inflation in Ghana's economy.

The introductory section is preceded by section 2 which covers a brief review of literature. Section 3 deals with the research methodology and econometric tools used in the analysis. The data presentation, analysis and findings are covered in section 4 while the conclusions and recommendations are the contents of section 5.

Literature Review

In the interface between domestic debt and price levels in any economy (especially low income economies, LICs) two economic theories caught our interest: the loanable fund theory and the balanced growth theory.

The loanable funds theory of market interest rates stipulates that interest rate is determined by the demand for and supply of loanable funds. The term loanable funds include all forms of credit such as: loans, bonds and savings deposit. Real interest is determined by the interaction of the forces of demand and supply and the players on the demand side are the private sector, individuals and government. Private sector demand is driven by the profit consideration, the individual by the income level and government demand is mostly affected by prevailing economic condition. Demand is determined by the level of investment and the yield. On the supply side, is a schedule of real savings? Interest rates influence the level of savings as there must be seemingly adequate compensation for people to part with their money. The key points of the loanable fund theory are that:

- The desired level of savings rises as interest rates go up
- The desired level of investment falls as the rate of interest rises
- The rate of interest changes smoothly and rapidly in such a manner as to keep the level of investment always equal to volume of savings.

A rise in interest rate orchestrated by shortage of loanable funds due to the crowding out effect of domestic debt exerts pressure on domestic prices of goods and services. The crowding out effect is minimal in economies with well-developed financial markets that can boast of unrestricted flows of capital (savings) for both private and public sector investments.

The Balanced growth (BG) theory

The BG theory was made popular by Ragnar Nurkse (1907-1959). It advocates for a simultaneous and harmonious development of different sectors of the economy such that all the sectors grow together. This can be achieved only through a sustainable balance of the demand and supply channels. The variables in the supply side - the interrelated activity sector that boost the supply of goods - must be made to grow together. Such activities will include agriculture, irrigation, investments in power and energy, transportation, tourism,

etc. The demand side is concerned with the provision of employment opportunities and increasing incomes so that the demand for goods and services will rise. The deduction from the BG theory is that if any side in the chain is short changed in the development process, disequilibrium is triggered. The consequences become inflationary if the tilt is in favour of excess demand and noticeable shortage in supply of goods and services exists.

Monetarists believe strongly too that inflation is a monetary phenomenon in the sense that a continuous increase in general price level is due to the rate of expansion in money supply far in excess of the actual quantity of money demanded by the economic units. The link between inflation and money supply is not instantaneous and studies have revealed that the lag is anywhere between 3 and 20 quarters.

The source of funding for domestic debt can breed inflation from the onset. For instance, borrowing from the central bank directly fuels inflation; similar results are obtained from seignorage. If government resources (taxes and revenues) dwindle and become unable to service the debt, the issue of inflation prone new money will be embarked upon and the result is excessive increase in money stock. On the other hand, banks' lending to the government reduces only the amount of loanable funds to the private sector; there would be no change in the assets and liabilities but mere transfers between the units. This channel is non-inflationary theoretically speaking as it represents a withdrawal from the private sector and an addition to the public sector leaving the balance unchanged and the impact neutralized.

Three types of inflation are common in the literature and easily discernible. These are cost-push, demand-pull and structural inflation. The increase in costs (supply shocks) promotes inflation; so too are the persistent demand for increase in wages and salaries by pressure groups such as trade unions. The demand pull inflation can be curtailed through a restrictive credit approach by the monetary authorities especially where supply remains free from shocks. Structural inflation is a consequence of a shift in demand and this could emanate from individual taste and preferences in a free market economy. Monetary policy or fiscal policy (government debt and expenditure) may not provide remedies for this manner of inflation.

The structural inflation theory (Julie Oliveira, 1964) posits that inflation occurs when the structure of a country's internal demand changes while the aggregate demand remains unchanged. The sectors with increased demand for their goods witness a general rise in prices and wages whereas in other sectors where demand declines, prices and wages do not trend downwards. Resources too do not shift away from industries with shrank demand in favour of those with rising demand and the tendency is an overall rise in prices in the economy as a whole.

Prah and Tenakwah (2017) studied the impact of government domestic borrowing on interest rates and inflation in Ghana for the period 2011 to 2016. The linear regression model was used as analytical statistical tool. The variables of the study are domestic debt, inflation and interest rates. The results show that about 64% of the variation in inflation can be explained by domestic debt

Adam, Sule, Ayo and Ibrahim (2016) investigated the impact of national debt on economic performance in Nigeria for the period, 1970-2013. They specifically sought to explore the impact of domestic debt on economic performance indicators: inflation, economic growth and unemployment. These variables were the regress and in three separate models of linear regression. The exogenous variables are Domestic debt as a percentage of GDP, Broad money supply, Credit to private sector, government capital

expenditure, the naira exchange rate, fiscal deficit and interest rates. They found that domestic debt has a positive and significant relationship with inflation.

Ahmed, Sheikh and Tariq (2012) researched on the connexion between domestic debt and inflationary effects in Pakistan for the period, 1972-2009. Money supply (M_2), total domestic debt, private investment, exports, budget deficit, interest paid on domestic debt, indirect taxes and exchange rates were the study variables. The findings indicate that domestic debt and debt servicing costs affect the price level positively with significant parameters. The study advocates for better tax regimes, reduction in government expenditure through structured reforms.

Mwangi (2009) examined the effect of domestic borrowing on private credit in Kenya between 1996 and 2008. The study found out that the government mainly finances its deficits through tax revenues, printing of money and borrowing. The tax base of Kenya is narrow and printing of money is not an option. The country too has reduced access to foreign loans and domestic borrowing becomes the only plausible option. The result of the study shows that domestic borrowing crowds out private sector investment and has inflationary effects in the economy.

Kannan and Singh (2009) investigated the policy conduct and stability of public debt in India for the period 1971-2006. The study seeks to capture the dynamic interactions of deficits and debt with macroeconomic variables such as inflation, interest rate, trade gap and output by applying a 2SLS (two stage least square) simulation technique. The findings reveal that fiscal deficits and debt have adverse effects on all macroeconomic variables under consideration in both the medium and long terms. They concede that a vast knowledge of the behaviour of domestic debt and inflation is not available because very limited studies exist on same. But basic knowledge of logic and economics, they assert, should propel the idea that internal borrowing is likely to increase the price level.

Bildrici and Ersin (2007) examine the relationship between domestic debt and inflation for those countries that have higher inflation. They conclude from their study that the cost of domestic debt increase on account of inflation. The increasing debt to GDP ratios led these countries to borrow more at a higher cost and lower maturity.

Faraglia, Marcet, Oikonomou and Scott (2012) researched on the effect of government debt maturity on inflation using dynamic stochastic general equilibrium (DSGE) model. The variables used in the study were fiscal insurance, government debt, inflation, interest rates, fiscal sustainability and maturity. The findings reveal that the persistence and volatility of inflation depend on the sign, size and maturity structure of government debt. They are of the opinion that the issuance of longer term debt can help government utilize inflation more to achieve fiscal sustainability. The longer the maturity of the debt, the more persistent and volatile is inflation. The impact of debt on inflation is modest; equally modest is the relative role played by inflation in achieving fiscal balance. However, the researchers observed that a more substantial contribution to debt stability came from twigging interest rates.

Seidman (1986) carried out a study on Zimbabwe's economy between 1970s and 1980s basically to ascertain the impact of domestic debt and other factors on inflationary pressures. The findings reveal that increased public debt primarily directed to non-productive sectors of the economy leads to rising prices. Attempts to control inflation by raising interest payments by central bank imposes a higher burden on tax payers, channels additional fund to financial sector at the expense of small business efforts towards output expansion.

Methodology

The study adopted a quantitative approach and convenience sampling was used. The review of existing literature from recognized journals, reports and publications. Secondary data was sourced from mostly the Bank of Ghana. A multiple linear regression model within the context of a panel study was applied to model a relationship between variables by fitting a linear equation to observed data. The model specification is functionally stated thus:

Inflation = f (Domestic debt, Money supply, Credit to private sector, etc.);
Econometrically,

$$INF = \alpha_0 + \beta DDS + \eta Xs + \mu_t \quad (1)$$

Where,

INF = inflation, α_0 , the intercept, DD, domestic debt and Xs, a vector of other exogenous variables. β , η , are the parameters while μ , is the error term. The pooled mean group model by Pesaran and Smith (1999) was applied in the original panel study that investigates the connexion between domestic debt and three African countries of Egypt, Ghana and Nigeria

$$\Delta INFL_{it} = \gamma(INFL_{it-1} - \delta_{0i} - \delta_{1i}DDS_{it} - \delta_{2i}M2_{it} - \delta_{3i}GEXP_{it} - \delta_{4i}INT_{it} - \delta_{5i}CPS_{it}) - \vartheta_{20i}\Delta DDS_{it} - \vartheta_{30i}\Delta M2_{it} - \vartheta_{40i}\Delta GEXP_{it} - \vartheta_{50i}\Delta INT_{it} - \vartheta_{60i}\Delta CPS_{it} + \epsilon_{it} \quad (2)$$

Data Analysis and Discussion

The relationship between domestic debt and inflation in Ghana is hard to establish. A visual inspection and analysis of Figures 1a, 1b and 1c speak volumes of the above nexus. Ghana's domestic debt has been on the increase and so too is the inflation rate. Surprisingly, between 2009 and 2013, the inflation rate was on a steady decline despite an upsurge in domestic debt as depicted in the figures under reference. Inflation rates were high even at low levels of domestic debt between 2006 and 2009. From 2013, it can be justifiably presumed that higher levels of domestic debt breed higher inflation in the economy even though empirical statistical evidence is still needed for affirmation of this assertion. It can be inferred from the analysis of the data that mixed results emerge.

Table 1 below shows extract from our analytical tool of the PMG used in the panel study. The data is shown in Appendix 1.

Table 4.14: Differential Results for Model 2; p-values in brackets

Variable	Ghana	Nigeria	Egypt
ECT_{t-1}	-0.7635*** (0.0001)	-0.4895*** (0.0004)	-0.4228*** (0.0040)
LDDR	-0.1488** (0.0200)	-0.0879 (0.8681)	-2.2671* (0.0945)
LM2R	-0.5536 (0.2358)	-1.7064* (0.0539)	0.7246 (0.9218)
LGEXP	-0.4304 (0.8683)	-0.5388 (0.6683)	1.0363 (0.9735)
LINT	0.9495*** (0.0008)	0.1325 (0.3469)	-0.0603 (0.9278)
LCPSR	0.2220 (0.4946)	1.0942** (0.0358)	0.3811 (0.9138)
CONSTANT	-11.264	-6.6304	-6.5066

(0.7851)

(0.7522)

(0.8183)

Source: E-Views 11 Output

*indicates significance at 10% level

**indicates significance at 5% level

***indicates significance at 1% level

Table 4a is an extraction from the pooled mean group (PMG) model; it displays the short run differentials of country specific in the panel model. It can be easily seen that domestic debt in Ghana has a negative impact on inflation. A percent increase in domestic debt is associated with 0.14% decline in inflation. In other words, domestic debt reduces inflation. The parameter of the DDR is highly significant. When there are shocks in the economy, the reversal is very slow as the ECT is put at less than 0.5%; the ECT however, has the right negative sign and is equally statistically significant.

The other control variable in the model which is closely related to inflation is the interest rate. Ironically, it exhibits contrast behaviour with inflation in that domestic debt has a positive and highly significant impact on interest rate. Both findings suggest that the channel by which domestic debt propagates the crowding out phenomenon is probably not in the cost of funds but through the size of available credit to the private sector investors. The variable of LCPSR confirms this assertion. Domestic debt has equally a negative and highly statistical impact on credit to private sector (LCPS). In the long run however, domestic debt promotes inflation.

Hypothesis testing - the null hypothesis as stated below will be tested;

H_0 : Domestic debt has no significant effect on price level in Ghana

For empirical model, price level, which is measured by inflation, is specified to depend on domestic debt ratio, controlling for money supply ratio, government expenditure ratio, deposit interest rate, and credit to private sector ratio. This model was estimated with the results for each country reported in Table 4. Therefore, our hypothesis would be tested based on the reported p-value attached with the coefficient on domestic debt ratio in the column for Ghana. The elected significance level is 0.05.

Decision rule

Reject hypothesis if the p-value associated with *DDR* in the column for Ghana is less than 0.05; otherwise, hypothesis would be maintained. Table 4 shows that the p-value associated with *DDR* for Ghana is 0.0200, which is low compared to 0.05, hence, the test is significant at 5% level. Therefore, we reject null hypothesis and conclude that domestic debt has a significant impact on price level in Ghana.

Conclusion and Recommendation

Domestic debt has significant relationship with price level in Ghana. Ironically and against all theoretical and common sense expectations, the negative parameter suggests an inverse relationship. That is to say that domestic debt leads to fall in price level in Ghana. This contradicts the findings of Ahmed, Sheikh and Tariq (2012), Adam, Sule, Ayo and Ibrahim (2016), Mwangi (2009) and others. A vast knowledge on the interaction between domestic debt and inflation is unavailable due to paucity of studies in that sphere but Kannan and Singh (2009) believe that basic knowledge of logic and economics should propel the idea that internal borrowing is likely to fuel increase in price level. Studies also reveal that persistence of inflation depends on the sign, size and maturity of government debt. Seidman (1986) found that increased public debt applied to non-productive sectors of the economy leads to rising prices. Ghana's exceptional result may be the consequence of

proper utilization of domestic debt and debt policy that recognizes the pitfalls in debt tenor mismatches,

It is recommended that Ghana should continue with the existing policies on debt procurement where necessary and persist in the use of debt instruments with longer maturity.

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