Domestic Debt and Monetary Policy Transmission in The Gambia

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ABSTRACT

The increase in domestic government debt has heightened the fear of fiscal-monetary interactions in the developing economies, especially the small open economies that have shallow financial markets. Although much focus has been given to the sustainability of external debt, short-term monetary transmission impacts of domestic public debt have not been well studied in the low-income countries. This paper examines the short-term macroeconomic impact of domestic public debt on the vital monetary policy indicators in the Gambia between the years 1983 and 2022. The analysis can determine the effects of domestic borrowing on money supply, interest rates, inflation and exchange rate fluctuations using annual time-series data and an Autoregressive Distributed Lag (ARDL) framework suitable to study integrated processes and small samples. The unit root and cointegration tests have ensured that there is a stable relationship of the long run between the variables, whereas short run ARDL estimates have shown that there are statistically significant fiscal-monetary transmission effects. The findings show that an increase in domestic public debt increases the money supply, raises interest rates, creates inflationary pressures and also leads to currency depreciation in the short term. The results obtained support empirically fiscal dominance and crowding-out processes in financially constrained economies. The work is novel in the literature by presenting one of the longest four-decade time-series studies of domestic debt-monetary interactions in The Gambia and to the wider body of knowledge on fiscal-monetary interactions in Sub-Saharan Africa. The results highlight the need to have prudent domestic debt management, strengthened fiscal discipline, and improved fiscal-monetary coordination to protect the macroeconomic stability.

Keywords: *Domestic Public Debt; Monetary Policy Transmission; ARDL; Fiscal Dominance; Inflation; Exchange Rate; The Gambia.*

1. Introduction

The increase in the level of public debt has returned to the centre of the macroeconomic agenda of developing and frontier economies, especially after the global financial crisis, pandemic-related fiscal expansions and the stricter liquidity conditions in the world. Although public borrowing may be used as a tool of development financing and macroeconomic stabilization, the accumulation of persistent debts, in particular, domestic public debt, can cause considerable changes in monetary policy delivery, financial market balance, and price inflation (International Monetary Fund [IMF], 2023; World Bank, 2022). Relationship between fiscal and monetary agencies has thus taken a new centre stage in theoretical and empirical macroeconomic studies.

Domestic borrowing can have direct liquidity effects on the banking system, as well as impact on interest rate arrangements, and create inflationary or exchange rate pressure when fiscal dominance limits central bank autonomy, in small open economies with shallow financial systems (Leeper, 2018; Bianchi and Melosi, 2019). Under fiscal dominance, financial authorities might be forced to comply with the financing requirements of governments, and lose the capacity to conduct price stability policies unilaterally. This problem is especially topical in low-income nations where domestic debt markets are frequently held in short-term treasury securities and where refinancing risk is high.

The Gambia is a strong example of the fiscal monetary nexus to study it. The nation has witnessed a continuous rise in the amount of public debt over the last two decades, and the total amount of public debt is over 80 percent of the GDP in recent years (IMF, 2023). A large proportion of this debt is internally funded by means of treasury bills and government bonds, a large number of which are short term debts. This kind of dependency on local borrowing would be subjecting the economy to liquidity shocks, crowding out and refinancing risks. As of 2023, the proportion of domestic debt in total public debt is large and shows a big portion of on-year rollover, which leads to rollover risks and strong interactions between fiscal operations and monetary conditions.

There is a difference in the macroeconomic effects of both domestic and external public debt. In contrast to the primary impact of external borrowing on the sustainability of the balance of payments and the exchange rate risk, domestic borrowing has a direct effect on domestic liquidity, the balance sheets of the banking sector, and short-term interest rate dynamics (Akanbi, Uwaleke, and Ibrahim, 2022; Ackah, 2023). The issue of government debt instruments into the domestic market can either absorb the liquidity in the private sector or make central bank interventions that increase monetary aggregates. This may be converted into inflationary pressures or depreciation of the exchange rates, especially in economies with limited finances.

Although the issue of debt sustainability has increased in relevance in The Gambia, there is still a lack of empirical research carried out on the exact impact of domestic public debt on the monetary policy variables. The existing literature has paid much attention to the determinants of the accumulation of a level of public debt (Jarju, 2021) or macroeconomic dynamics, in general, without modelling the relationship between domestic debt and monetary policy indicators. Besides, the existing literature on Sub-Saharan Africa in the region focuses on debt sustainability and fiscal tightening (Mupunga and Ngundu, 2020; Egbuna et al., 2019), and relatively little is said about the effect of domestic borrowing on money supply growth, inflation, interest rates, and exchange rate behaviour in small open economies.

In theory, a number of frameworks can shed some light into the connection between domestic public debt and monetary outcomes. According to the fiscal theory of the price level, fiscal imbalances can lead to a situation in which the monetary policy serves as a means to finance fiscal needs, which can create inflationary pressures (Leeper, 2018). According to the debt overhang hypothesis, high levels of debt impair macroeconomic choices and limit the capacity to implement policies, which in turn may of influence interest rate regimes and investment behaviour (Akanbi et al., 2022). In the meantime, the crowding-out hypothesis holds that government borrowing increases the demand of the loanable funds, which may

lead to an increase in interest rates and a decline in the level of private investment (Mukhtar and Zakaria, 2010). However, in economies that are financially repressed, governments can reduce interest rates with administrative or central bank intervention, which changes the conventional crowding-out effect.

The mixed findings can be seen throughout emerging and developing economies based on the empirical evidence. Ackah (2023), which investigates the case of Ghana, concludes that domestic debt can affect the monetary policy rates, but the relationship between the two is not necessarily statistically significant in the long-run. According to Mothibi and Mncayi (2019), the dynamics of the public debt in South Africa show high macroeconomic interactions in the long run, but the short-run impacts might not be the same as the relationships in the long-run. In the same way, Djinkpo (2019) emphasizes the role of fiscal policy tools in developing the debt relations and aggregate demand in The Gambia, emphasizing the interaction of fiscal and monetary frameworks. Nevertheless, there is limited evidence on the impact of domestic public debt on money growth, inflation, interest rates, and exchange rates in The Gambia which is systematic time-series.

This paper fills this gap by analyzing the short run association between domestic public debt in The Gambia as well as the important monetary policy indicators in the years 1983-2022. Particularly, the analysis is an evaluation of the impact of domestic public debt on money supply, interest rates, inflation, and exchange rate changes through time-series econometric methods that are suitable in integrated data. The study removes the channel of internal financing by specifically looking at the domestic debt, rather than total public debt, and thereby isolating which the fiscal operations can affect the monetary policy.

This paper has threefold contribution. First, it offers one of the most detailed time-series analyses of monetary policy interaction with domestic debt in The Gambia during a 4-decade time-span. Second, it provides empirical evidence on the short-run transmission channels between domestic borrowing and monetary aggregates, and price dynamics of small open developing economy. Third, the results add to the general body of work on fiscal-monetary interactions in Sub-Saharan Africa in which institutional limitations and inadequate financial markets can increase the macroeconomic impact of domestic borrowing.

The dynamics are critical in understanding the policy makers who would aim at bringing about balance between fiscal sustainability and macroeconomic stability. In a type of economy with a small fiscal room and a dynamic monetary system, the relationships between the domestic debt accumulation process and the effectiveness of the monetary policy are at the core of sustainable growth and price stability.

2. Literature Review and Theoretical Framework

The interplay between public debt and monetary policy is a topic to which a new academic interest has been given over the past few years, especially in developing and emerging markets where fiscal pressures and institutional binds tend to make macroeconomic management more difficult. Although the issue of the public debt may act as a development and stabilization mechanism, its macroeconomic effects are highly dependent on the structure, maturity profile, and monetary authorities interaction (IMF, 2023; World Bank, 2022). The existing theoretical and empirical literature has a number of competing views on

the impact of domestic public debt on the monetary conditions, inflation, interest rates and exchange rate behaviour.

The fiscal theory of the price level provides one of the background theories that relate monetary results and public debt. Under this school of thought, the intertemporal budget constraint of the government only serves as a determinant of the price level, in addition to the monetary aggregates (Leeper, 2018). When long-term fiscal deficits are obtained by domestic borrowing by fiscal authorities, monetary authorities might need to concede fiscal imbalances. In this regard, fiscal dominance is formed in which the central bank finds it practically difficult to cope with inflation as monetary policy becomes inferior to the demands of debt sustainability (Bianchi and Melosi, 2019). This model implies that an increase in domestic public debt can create the inflationary impulse in the event that investors believe that monetary growth in the future will be employed to stabilize debt relationships.

Mighty close to it is the unpopular monetarist arithmetic postulation promoted by Sargent and Wallace (1981) that claims that an endeavour by central bank to lower inflation rate by tight monetary policy could be futile when fiscal deficits could not be sustained. In this case, monetary accommodation in future is bound to happen, thus compromising on the recent stabilization attempts. Such a dynamic is capable of increasing macroeconomic volatility in small open economies that lack fiscal space.

The crowding-out hypothesis is another theory of importance. In the classical concept of loanable funds, when a government borrows more, it will increase the demand on credit and this will consequently cause an increase in the interest rates and the decrease of private investment (Mukhtar and Zakaria, 2010). Financial repression or administrative management of interest rates can be the outcome of domestic borrowing in the financially shallow systems in which the domestic banks are large holders of government securities. When this happens, the interest rate response can be dampened or may even change to the negative direction assuming the central bank comes in to bail out the fiscal operation. This is a twofold possibility, and thus empirical research is especially significant in the situation of developing economies.

According to the debt overhang hypothesis, the huge debts create distortion in economic incentives and limitations in macroeconomic policy decisions (Akanbi, Uwaleke, and Ibrahim, 2022). The concept of sovereign default risk was originally applied to domestic debt dynamics. The fiscal flexibility of a government might be minimized due to high debt servicing costs which limits the government to adopting countercyclical policies and this may have an impact on the openness of monetary transmission channels. Fiscal-monetary coordination can become more complicated when a big portion of the government income is spent on servicing debt.

In the small open economies, domestic public debt can also have a hand in exchange rate dynamics. Domestically financed government borrowing can have an impact on the liquidity and investor confidence. In case the accumulation of debt is an indicator of fiscal weakness, the outflow of capital or devaluation of the exchange rate may occur (IMF, 2023). On the other hand, domestic borrowing can decrease external debt dependence and remove the risk of currency mismatch, which is also dependent on the context of such relations.

In Sub-Saharan Africa, there is mixed evidence based on empirical evidence available. Investigating the case of Ghana, Ackah (2023) reports that there is a positive short-run relationship between domestic debt and policy rates but weaker long-run relationships. Mothibi and Mncayi (2019) show that the public debt has high interactions with the macroeconomic indicators over time, where the growth and price stability are dependent on debt accumulation in South Africa. The study by Egbuna et al. (2019) demonstrates that the debt sustainability thresholds are important to macroeconomic stability in the West African economies, which implies nonlinear impacts of debt accumulation. On the same note, Mupunga and Le Roux (2015) illustrate that the macroeconomic shocks have a tremendous impact on the dynamics of debt in Zimbabwe, showing the feedback between monetary and fiscal variables.

Research with specific interest in The Gambia is rather scarce. Djinkpo (2019) uses the New Keynesian framework to examine the fiscal policy and the dynamics of debt with a special focus on tax instruments and fiscal contraction. Jarju (2021) examines the factors of the public debt through an ARDL model and finds that trade openness and investment are the decisive factors. There is however a direct relationship between domestic public debt and core monetary policy variables and neither of the studies explicitly model these relationships. This is a huge shortcoming in the country specific literature.

To a larger extent, recent cross-country data indicates the macroeconomic effect of domestic debt is related to institutional quality, central bank independence, and the depth of financial markets (Gan, Gondhi, and Yang, 2022). Central banks in countries where they have independence in their operations may have minimal inflationary impacts related to debt accumulation. On the other hand, domestic borrowing may generate more monetary accommodation and exchange rate pressure in areas where fiscal pressures and shallow capital markets are the drivers of it.

The Gambian setting is a particularly empirically relevant setting. The financial structure in the country still is more concentrated where the domestic banks control large portions of government securities. A significant portion of domestic debt is represented by treasury bills and short-term bonds and this increases the roll over risks and the fiscal activities are tied up tightly with the management of monetary liquidity. In these circumstances domestic borrowing can have a direct effect on the growth in money supply either in direct central bank involvement or by the adjustment of balance sheets in the banking sector. Furthermore, exchange rate pressure in The Gambia is a small open economy that is heavily dependent on imports and remittances, and might be sensitive to fiscal signals.

A combination of the theoretical and empirical literature implies that there are various plausible transmission mechanisms where domestic public debt can have an impact on the monetary policy outcomes. First, the home borrowing can increase the liquidity and can affect the growth of money supply. Second, it can change the interest rate dynamics either by the crowding-out or policy accommodation effects. Third, it may cause inflationary pressure where the fiscal dominance affects monetary credibility. Fourth, it can affect the behaviour of exchange rates by working via confidence and liquidity.

Nevertheless, the nature and the direction and the scale of these effects are empirically uncertain especially in small developing economies with distinctive institutions. The available

literature highlights the necessity to include country-specific time-series analysis, which actively models the short-run interaction of macroeconomic. The present study, as a result, fills this empirical gap by creating an understanding of the interaction between domestic public debt and monetary policy variables in a financially constrained environment by concentrating on The Gambia during a 4-decade timeframe.

3. Methodology

3.1 Data and Variables

This paper looks into the short-run macroeconomic implications of domestic public debt on monetary policy variables in The Gambia based on annual time-series data between 1983 and 2022. The time horizon records spurt of fiscal growth, structural restructuring and monetary stabilization enabling dynamic fiscal monetary interactions to be identified.

The sources used to obtain data included the Central Bank of The Gambia, World Development Indicators (WDI) of the World Bank and IMF databases. The most important explanatory variable is domestic public debt (DD), which is a logarithm of total domestic government debt. The domestic debt is looked at independently of the external debt so that internal sources of fiscal financing and its interaction with the domestic monetary conditions can be identified.

The dependent variables will include broad money supply (M2), interest rate, inflation and exchange rate. All variables are logged, and where necessary, take first differences to make elasticities of the variables stationary and interpretable.

The empirical paradigm is based on the theory of fiscal-monetary interactions, which assumes that domestic borrowing can affect the dynamics of liquidity and price stability, as well as the dynamics of interest rates, especially in economies with fiscally limited opportunities (Leeper, 2018; Bianchi and Melosi, 2019).

3.2 Econometric Strategy

In order to estimate short-run transmission, the baseline dynamic specification is:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \, \Delta Y_{t-i} + \sum_{j=0}^{q} \beta_j \, \Delta DD_{t-j} + \varepsilon_t$$

where Y_t denotes all the monetary policy indicators and DD_t is domestic public debt. Lagged dependent variables are used to control the persistence of monetary aggregates and macroeconomic inertia as well as to distribute lagged fiscal transmission effects through the lagged lags of debt.

As the data were time-series in nature, the tests of stationarity were conducted with the help of Augmented Dickey Fuller (ADF) and Phillips Perron (PP) (Phillips and Perron, 1988). All the variables are integrated of order one, I(1). Using the Johansen cointegration tests show the existence of a single long-run equilibrium relationship between the variables. Nevertheless, in accordance to the aim of the study to determine short-run macroeconomic responses, and the small sample size (T = 40), estimation is based on short-run dynamics.

3.3 ARDL Estimation

The estimation of short-run relationships is done using the Autoregressive Distributed Lag (ARDL) structure (Pesaran, Shin, and Smith, 2001). The ARDL methodology is suitable since:

1. It is effective in small samples.
2. It can fit regressors of order I(0) or I(1) type.
3. It has permissible Lag structures.
4. It addresses the endogeneity issues by dynamic specification.

The Akaike Information Criterion (AIC) is used to select the Lag length so as to obtain parsimony. ARDL models are estimated separately on money supply, interest rate, inflation and exchange rate to estimate specific fiscal transmission channels instead of placing a system wide restraint.

3.4 Diagnostic and Stability Procedures

The standard diagnostic tests were undertaken to provide the econometric validity. The Durbin Watson statistic was used to determine serial correlation. The Breusch-Pagan/cook-Weisberg test was used to test heteroskedasticity. Q-Q diagnostics were used to test the residual normality.

In order to assess model stability, the residual diagnostics were also investigated to ensure that estimated coefficients are not caused by misspecification. Because the macroeconomic conditions in The Gambia are volatile, issues of stability are of special concern, but the problem of small samples inhibits formal structural break tests.

3.5 Identification and Interpretation

According to the empirical strategy, the short-run effects of fiscal-monetary transmission are determined by estimating the marginal effect of domestic-debts changes of changes in monetary indicators, and adjusting dynamic persistence. The meaning of coefficients is thus the elasticities of monetary results in reference to domestic borrowing.

The methodology is able to provide strong results in identifying macroeconomic responses in the short-run to accumulation of domestic public debt by integrating integration testing, cointegration analysis, dynamic ARDL modelling, and stringent diagnostic verification.

4. Results and Discussion

4.1 Descriptive Analysis

The descriptive statistics of the key variables in the period between 1983 and 2022 are in Table 1. The domestic public debt is quite varied with standard deviation of 14.82 and a mean of 49.22 with a range of 17.67 to 73.69. The skewness (-0.611) is negative and this means that there were more high debt levels towards the end of the sample period, which is an indication that domestic borrowing in The Gambia was on an upward trend. This trend is in line with the latest IMF and World Bank estimates that have pointed to increased domestic debt weaknesses in small economies that are open.

Table 1: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Dev.	Skewness	Kurtosis
Domestic Debt	40	17.67	73.69	49.2161	14.82137	-0.611	-0.314
Inflation Rate	40	-0.17	4.04	1.8525	0.84224	-0.253	1.042
Interest Rate	40	2.04	3.51	2.911	0.34394	-0.926	0.535
Exchange Rate	40	0.97	4.04	2.8488	0.83842	-0.332	-0.934
Money Supply	40	2.38	4.04	3.2232	0.47086	-0.198	-0.693

Inflation is also not too high because the average is 1.85 and the standard deviation is 0.84, but the positive kurtosis (1.042) indicates that there are some periods of inflationary jumps. The interest rates are more stable (mean = 2.91; SD = 0.34), though the negative skewness (-0.926) suggests the existence of the moments when the interest rates are high. The exchange rate changes exhibit moderate dispersion (mean = 2.85; SD = 0.84) in terms of currency adjustment and pressures to depreciate the currency. Money supply exhibits stable growth patterns (mean = 3.22; SD = 0.47), which reflects a trend of growing liquidity trends as time goes by.

Comprehensively, the descriptive statistics indicate that the growth of domestic debt had been accompanied by the changes in the main monetary variables and, thus, led to the official econometric study of its relationships.

4.2 Diagnostic Tests

4.2.1 Test for Autocorrelation

Diagnostic tests were first performed before the estimation of the dynamic relationships to verify the assumptions of the econometric models.

Table 2 displays the value of Durbin Watson. The value of Durbin Watson 1.95299 estimated is near to the standard value of 2 which implies that there is no first-order correlation in residual values. This is an indication that dynamic lag structure is reasonably effective to capture the persistence in the data and the residuals are white noise. Lack of serial dependence enhances the confidence of the statistical validity of the ARDL estimates, and warrants the reliability of inference based on t- and F-statistics.

Table 2 : Autocorrelation test

Variables	Durbin–Watson d-statistic
LNDD, LNIFL, LNINT, LNEXCH, LNMS	1.95299

4.2.2 Test for Heteroskedasticity

The Breusch-pagan/cook-Weisberg test was used to test heteroskedasticity. Non-constant error variance in time series regression can result in inefficient estimates and biasness of standard errors, which could give incorrect test results.

The chi-square statistic of the test results is 1.08 and the p-value of 0.2997. The p-value value is greater than the 5 percent level of significance therefore the null hypothesis of homoskedasticity can not be rejected. This means that the variance of the residuals will be constant throughout the observations.

The lack of heteroskedasticity is used to confirm the efficiency of the estimated standard errors used and that the inference statistics is not affected by the instability in the variances. In addition, constant variance allows the strength of the Phillips-Perron unit root findings and the high-quality of the short-run ARDL coefficient estimates.

4.2.3 Normality Test

Normality of residuals is assessed using a Q–Q plot.

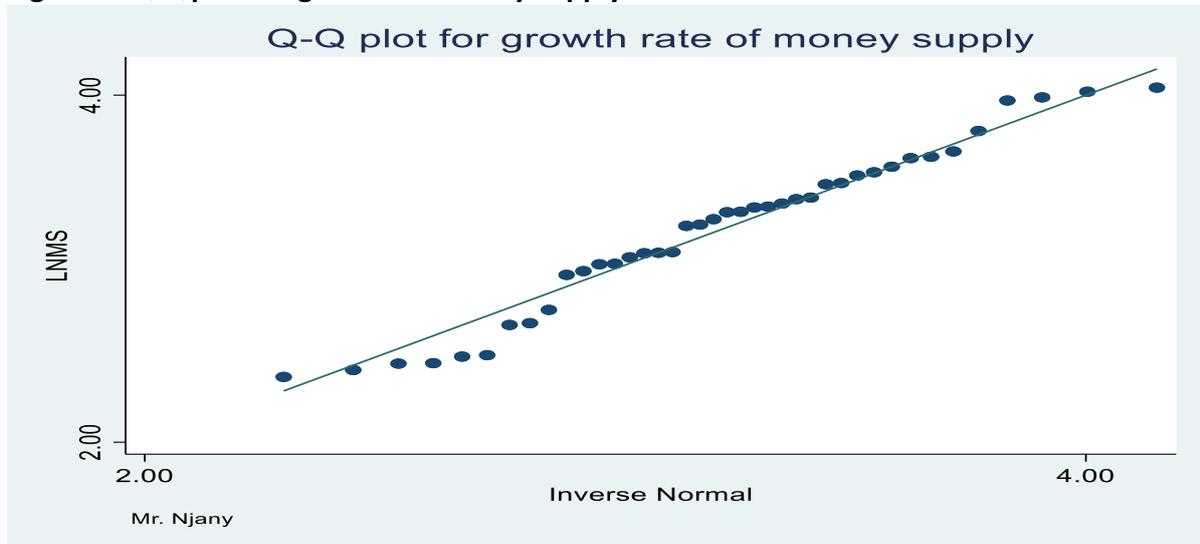**Figure 1: Q-Q plot for growth of money supply**

Figure 1 illustrates a good deviation to the reference line with close approximations indicating normal values. The Q-Q plot also suggests that residuals are approximately normally distributed, and the deviations at the ends of the distribution are mild. Since the sample is 40 observations in the sample, such short-term deviations do not significantly impact inference.

4.3 Unit Root Tests

4.3.1 Augmented Dickey–Fuller (ADF) Test

Before the estimation of the model, the unit root tests were performed in order to understand the time-series characteristics of the variables and to prevent spurious regression. With non-stationary series, traditional regression can provide biased and unreliable results unless stochastic trends are adequately taken into consideration.

Each variable was tested using the Augmented Dickey Fuller (ADF) test in both level and first difference. Table 3 provides the results.

Table 3: Augmented Dickey–Fuller (ADF) Unit Root Test Results

Variable	Stationarity at level	Remarks	Stationary after first differencing	Remarks
LNDD	0.78243	Non-Stationary	0.00321	Stationary
LNMS	0.59373	Non-Stationary	0.00296	Stationary
LNIFL	0.82734	Non-Stationary	0.00132	Stationary
LNEXCH	0.27351	Non-Stationary	0.01183	Stationary
LNINT	0.37946	Non-Stationary	0.00724	Stationary

4.3.2 Phillips–Perron (PP) Test

The Phillips-Perron (PP) was also used to ensure the stationarity results were robust. Whereas the ADF test manages the issue of serial correlation by incorporating lagged difference terms, the PP test manages the issue of non-parametrically the serial correlation and heteroskedasticity by modifying the test statistics (Phillips and Perron, 1988). The

combination of the two procedures enhances the belief of the series integration order. Table 4 gives the result of PP test.

Table 4: Phillips–Perron (PP) Unit Root Test Results

Variable	Stationarity at level	Remarks	Stationary after first differencing	Remarks
LNDD	0.32787	Non-Stationary	0.00431	Stationary
LNMS	0.30243	Non-Stationary	0.00428	Stationary
LNIFL	0.41093	Non-Stationary	0.00253	Stationary
LNEXCH	0.51802	Non-Stationary	0.00571	Stationary
LNINT	0.40782	Non-Stationary	0.00226	Stationary

4.4 Cointegration Analysis

The results of the Johansen cointegration test are given in Table 5. The Trace and Maximum Eigenvalue statistics suggest that there are one cointegrating relationship coupled between the variables.

Table 5: Johansen Cointegration Test Results

Rank	Parameters	Log-Likelihood (LL)	Eigenvalue	Maximum Trace Statistic	Critical Value (5%)	Maximum Eigenvalue	Critical Value (5%)
0	72	-69.04982	.	197.582	156	80.0109	51.42
1	87	-29.04436	0.87822	117.5714*	124.24	44.9764	45.28
2	100	-6.556177	0.69382	72.595	94.15	23.6035	39.37
3	111	5.2455812	0.46267	48.9915	68.52	19.8816	33.46
4	120	15.186404	0.40738	29.1098	47.21	16.4398	27.07
5	127	23.406296	0.3512	12.6701	29.68	9.5608	20.97
6	132	28.186697	0.22244	3.1093	15.41	2.561	14.07
7	135	29.467176	0.06517	0.5483	3.76	0.5483	3.76
8	136	29.741323	0.01433				

By analysing the Johansen cointegration test, it can be seen that there was one cointegrating relationship between domestic debt, money supply, inflation, interest rate and exchange rate. The Trace and Maximum Eigenvalue statistics show that there is a stable long-run equilibrium relationship.

The existence of cointegration implies that domestic public debt will be moving in the same direction as monetary indicators in the long run although there could be short-run variations. This finding is consistent with the results of Mupunga and Le Roux (2015), who report long-run fiscal-macroeconomic relationship in Zimbabwe, and Egbuna et al. (2019), who report debt-macroeconomic relationships in the West African economies.

4.5 Correlation Analysis

Table 6 shows the pairwise correlation of the values. Domestic public debt has poor positive co-relations with inflation and money supply, and moderate co-relations with the exchange rate.

Table 6: Pearson Correlation Matrix

Variable	LNDD	LNIFL	LNINT	LNEXCH	LNMS	presidents' dummy
LNDD	1					
LNIFL	0.0868	1				
	0.5945					
LNINT	0.1264	0.5438	1			
	0.4371	0.0003				
LNEXCH	0.2463	0.1765	0.4332	1		
	0.1255	0.2759	0.0052			
LNMS	0.1120	0.1258	0.0493	0.6578	1	
	0.4913	0.4392	0.7626	0.0000		

According to the pairwise correlation matrix, the domestic public debt has weak positive correlations with inflation and the money supply, and the moderate positive correlations with the exchange rate movements. It is weakly negative correlated to interest rates.

Though the magnitudes are small, none of the coefficients show any issues of multicollinearity. The moderate positive relationship between exchange rate and money supply (0.6578) is an indication of the monetary transmission processes which is associated with small open economy where expansion of liquidity usually operates in combination with the exchange rate changes.

Nevertheless, correlation analysis does not have the ability to reflect the dynamic causality or structural relationship hence the need to estimate the ARDL.

4.6 ARDL Short-Run Estimation Results

4.6.1 Effect of Domestic Public Debt on Money Supply

The findings of the ARDL regression analysis of domestic public debt and money supply are provided in table 7. LNDD is positively correlated and significant (p = 0.005).

As the ARDL results show, domestic public debt has a positive and statistically significant impact on money supply growth in the short run. The coefficient of LNDD (0.015, p = 0.005) indicates that monetary expansion is related to the rise in domestic borrowing.

This observation aligns with the fiscal accommodation theory, where there is the assumption that government borrowing can increase the liquidity when it is raised in the domestic financial markets. Djinkpo (2019) records similar findings by discovering that the fiscal variables have a type of impact on the liquidity conditions in The Gambia with the New Keynesian mechanism. It further coincides with empirical findings in Sub-Saharan Africa that domestic borrowing tends to pass on via the banking sector, which changes the monetary aggregates.

Although, it is clear that the domestic debt contributes a moderate proportion of the fluctuations in the money supply (R to = 0.205) implying that additional macroeconomic variables have important contributions.

Table 7: ARDL Estimates- Effect of Domestic Public Debt on Money Supply

Predictor	Coef.	St. Err.	t-value	p-value	95% Conf. Interval
LNDD	0.015	0.005	3	0.005	[0.005, 0.025]
Constant	0.01	0.018	0.5	0.62	[-0.031, 0.051]

Mean Dependent var = 0.017, SD Dependent var = 0.183
R-Squared = 0.205, Number of observations = 39
F-test = 9.00, Prob > F = 0.005
Akaike crit. (AIC) = 30.500, Bayesian crit. (BIC) = 27.200

4.6.2 Effect of Domestic Public Debt on Interest Rate

The ARDL results of the domestic debt and interest rate are presented in Table 8. The coefficient is positive and statistically significant (p = 0.027) with which the crowding-out hypothesis is supported.

The ARDL findings also indicate that domestic public debt is a positive and statistically significant factor in the interest rates (coefficient = 0.045, p = 0.027). This confirms the crowding-out hypothesis as postulated by the Keynesian theory that states that the higher the government borrowing, the higher the demand of loanable funds, which in turn places an upward pressure on interest rates.

This finding compliments the result of Mukhtar and Zakaria (2010) who note the same fiscal-interest rate association in the developing economies. It is also consistent with Ackah (2023), who points out that monetary policy rates are sensitive to the dynamics of debt in Ghana.

In Gambian context where the debt instruments in the domestic debt form a significant percentage of the financial market assets, further issue of Treasury bills can widen the liquidity and may raise the yield.

Table 8: ARDL Estimates -Effect of Domestic Public Debt on Interest Rate

Predictor	Coef.	St. Err.	t-value	p-value	95% Conf. Interval
LNDD	0.045	0.015	3.021	0.027	[0.076, 0.015]
Constant	0.017	0.04	0.514	0.629	[0.062, 0.102]

Mean Dependent var = 0.003, SD Dependent var = 0.395
R-Squared = 0.210, Number of observations = 39
F-test = 6.37, Prob > F = 0.005
Akaike crit. (AIC) = 25.500, Bayesian crit. (BIC) = 28.700

4.6.3 Effect of Domestic Public Debt on Inflation

As indicated in Table 9, inflation is boosted by domestic debt in the short run (p = 0.0042).

The findings demonstrate that domestic public debt has a significant impact of enhancing inflation in the short-run (p = 0.0042). This observation favors the fiscal dominance concept in which fiscal expansionary operations funded internally could create price pressures unless sufficiently sterilized by the central banks.

The inflationary effect of debt has been reported in a number of the developing economies. Mothibi and Mncayi (2019) discover that price stability in South Africa is affected by the

accumulation of public debt. On the same note, Siele and Serem (2022) emphasize inflationary effects of over-domestic borrowing in Kenya.

In The Gambia, an increase in domestic debt can be a cause of inflation because it can lead to liquidity expansion, exchange rate pass-through, and anticipation of monetizing in the future.

Table 9: ARDL Estimates -Effect of Domestic Public Debt on Inflation

LNINF	Coef.	St.Err.	T-value	P-value	[95% Conf Interval]
LNDD	0.073	0.015	2.28	0.0042	[0.076, 0.014]
Constant	0.017	0.11	0.18	0.8603	[0.202, 0.242]
Mean dependent var	0.002			F-test	7.38	
SD dependent var	0.784			Prob > F	0.005	
R-squared	0.247			Akaike crit. (AIC)	20.500	
Number of obs	39			Bayesian crit. (BIC)	23.827	

4.6.4 Effect of Domestic Public Debt on Exchange Rate

The ARDL results of exchange rate are found in Table 10. The positive and statistically significant effect (p = 0.005) of domestic debt is realized.

According to the ARDL findings, domestic public debt has positive and significant effect on the exchange rate movements (coefficient = 0.006, p = 0.005). The implication of this is that improvements in domestic debt are linked to depreciation of the currency in the short run.

This result is not surprising based on the theoretical predictions that fiscal expansion can undermine currency stability of small open economies. According to Jarju (2021), the debt dynamics of The Gambia record similar exchange rate sensitivities. Moreover, Egbuna et al. (2019) discover that debt accumulation has an impact on macroeconomic adjustment processes in the economies of West Africa.

The impact of high liquidity, investor confidence effect or anticipation of fiscal imbalance can make currency depreciation.

Table 10: ARDL Estimates -Effect of Domestic Public Debt on Exchange Rate

LNEXCH	Coef.	St.Err.	t-value	p-value	[95% Conf Interval]
LNDD	0.006	0.002	3.0328	0.005	[0.002, 0.010]
Constant	0.067	0.02	3.4319	0.001	[0.030, 0.110]
Mean dependent var	0.079			F-test	9.00	
SD dependent var	0.129			Prob > F	0.005	
R-squared	0.218			Akaike crit. (AIC)	25.000	
Number of obs	39			Bayesian crit. (BIC)	21.672	

4.7 Synthesis of Findings

Collectively, the empirical findings reinforce most of the evidence regarding the significant impact of domestic public debt on the main monetary policy indicators in the short term. Domestic borrowing is the cause of monetary expansion, higher rates of interest rates, heightened pressures of inflation and poor exchange rates stability. The results verify that independent debt is non-macroeconomic in The Gambia. Instead, it is directly in contact with

the monetary transmission mechanisms. This supports the debt overhang theory that states that the burden of debts can limit the management of the macroeconomy and impairs financial markets. Although the explanatory power of the individual models is moderate (R^2 between 0. 205 and 0. 247), the statistical consistency of individual specifications provides higher confidence in the strength of the results.

4.8 Limitations and Future Research

This research is limited in a number of ways. The annual data applied over such a small sample (19832022) could also restrict the frequency of fiscal monetary dynamics that could be of higher frequency. Even though the ARDL model focuses on the issue of integration and helps to overcome the endogeneity due to the dynamic's specification of the equation, the possibility of reverse causality between domestic debt and the monetary variables cannot be avoided fully. Moreover, the analysis also is limited to domestic public debt, and it does not explicitly include the external debt interactions and institutional quality, which can be relevant to the transmission mechanisms.

Subsequent studies might use data with greater frequency, use structural break analysis, or use VAR-based models to study bidirectional causality. Comparative regional analysis would also augment the comprehension of the fiscal monetary interactions in similar economies in which they are small economies.

5. Conclusion

The paper has investigated the short-run impact of domestic public debt on the important monetary policy variables in The Gambia between the years 1983 and 2022 using ARDL modelling. The study offers empirical evidence of the fiscal-monetary transmission process in a small open developing economy by combining time-series diagnostics, unit root testing, cointegration analysis and dynamic regression estimation.

The findings prove that domestic public debt is macro-economically non-neutral. Short-term domestic borrowing would expand money supply considerably, hike inflationary pressures, augmented rate of interest and also, assist in the depreciation of the exchange rates. These results are indicative that the level of accumulation of domestic debt has a direct effect on the liquidity conditions, the financial market rates, and price stability.

The upward trend of the association between domestic debt and money supply implies that government borrowing could increase liquidity in the local financial framework. Likewise, the beneficial influence on interest rates is in support of the crowding-out hypothesis whereby as the government borrowing increases, it exerts upward pressure on the markets of loanable funds. The domestic debt inflationary effect also indicates the aspect of fiscal dominance especially in cases whereby fiscal growth is not entirely sterilized by the central banks. Furthermore, the exchange rate response suggests that the effect of debt accumulation can undermine the currency stability either by the liquidity expansion or the fiscal credibility effect.

Though the explanatory power of each of the models is midrange, the consistency of statistically significant effects of all monetary indicators enhances the strength of the results. The fact that there is a long-run cointegrating relationship also suggests that the fiscal and monetary variables in The Gambia are structurally related.

Generally, the article attests that the domestic public debt is very essential in determining short-run monetary dynamics. When a country has a shallow financial market and there is low fiscal space, the high-dependence of domestic borrowing may cause macroeconomic imbalances. Such findings support the suitability of debt overhang theory and fiscal dominance models in explaining macroeconomic management issues in the developing nations.

6. Policy Recommendations

According to the empirical data, some policy implications can be derived on behalf of The Gambia.

To begin with, there is the need to manage domestic debt prudently. Due to the high inflationary and exchange rate impacts that were found as part of the research, the policymakers ought to employ a medium-term debt policy, which lowers overdependence on short-term domestic borrowing instruments. Refinancing risk can be mitigated by increasing the debt maturity and diversifying financing sources to counter the short-term macroeconomic strains.

Second, fiscal discipline has to be enhanced. To curb structural budget deficits, there should be sustainable revenue mobilization, better management of tax, and rationalization of state spending. It would enable curbing the growth of money supply by reducing the frequency of domestic borrowing, as well as reducing the spread of inflationary effect.

Third, the close coordination of monetary authorities and fiscal policymakers should be paid attention to. It is possible to avoid fiscal dominance where the fiscal policy is fixed by debt financing needs through increased fiscal-monetary coordination. Liquidity management, such as open market operations and sterilization instruments, can also be actively used to counter inflationary pressures related to the growth of debts.

Fourthly, loans must be used in productive investment. Growth dividends can be earned through domestic borrowing which funds infrastructure, export-enhancing sectors and productivity improvements which offset the possible macroeconomic distortions. Spending that is financed by debt should not focus on regular consumption, but capital formation.

Fifth, stability in currency exchange should be included in the debt management plan. However, as the growth of domestic debts are linked to depreciation of the currency, it is important to retain investor confidence and macroeconomic credibility. Unexpected debt reporting and following fiscal responsibility framework can also contribute to locking in expectations and decreasing the volatility of the exchange rate.

Lastly, a balance has to be maintained between external and domestic funding. Although foreign debt is associated with exchange rate risk, domestic over borrowing can choke off private investment and strangle the monetary environment. Having a well-weighing debt portfolio between the domestic and foreign funds can also help in enhancing macroeconomic stability.

References

Ackah, B. (2023). The relationship between policy rates and domestic debt in Ghana. *International Journal of Development and Economic Sustainability, 11*(4), 20–32. https://doi.org/10.37745/ijdes.13/vol11n42032

Akanbi, A., Uwaleke, U. J., & Ibrahim, U. A. (2022). Effect of external debt service on economic growth in Nigeria. *Journal of Service Science and Management, 15*(4), 437–451. https://doi.org/10.4236/jssm.2022.154026

Atta-Mensah, J., & Ibrahim, M. (2020). Explaining Africa's debt: The journey so far and the arithmetic of the policymaker. *Theoretical Economics Letters, 10*(2), 409–441. https://doi.org/10.4236/tel.2020.102027

Djinkpo, M. (2019). A DSGE model for fiscal policy analysis in The Gambia. *MPRA Paper No. 97874*. https://ideas.repec.org/p/pra/mprapa/97874.html

Egbuna, N. E., John-Sowe, M., Kargbo, S. M., Bawa, S., Diallo, I., Abubakari, H., Odeniran, O. S., Mendy, I., Sambola, E., & Adams, K. (2019). *Public debt sustainability in the West African Monetary Zone (WAMI Occasional Paper No. 17).* West African Monetary Institute.

Fetuu, E., & Rahman, I. U. (2022). External debt and economic growth: Case of a small island nation based on the Solow growth model. *Indian Journal of Economics and Development, 18*(4), 884–891. https://doi.org/10.35716/IJED/22180

Gan, L., Gondhi, N. R., & Yang, J. (2022). Debt structure and debt overhang. *Journal of Corporate Finance, 74*, 102200. https://doi.org/10.1016/j.jcorpfin.2022.102200

International Monetary Fund (IMF). (2023). *Debt sustainability analysis report: The Gambia*. IMF.

Jarju, S. (2021). *The determinants of public debt in The Gambia: An autoregressive distributed lag (ARDL) bound cointegration approach* (Master's thesis, KDI School of Public Policy and Management). https://archives.kdischool.ac.kr

Kurniasih, E. P. (2021). The effect of foreign debt on economic growth. *Jurnal Ekonomi Malaysia, 55*(3), 125–136. https://doi.org/10.17576/JEM-2021-5503-09

Mothibi, L., & Mncayi, P. (2019). Investigating the key drivers of government debt in South Africa: A post-apartheid analysis. *International Journal of eBusiness and eGovernment Studies*, 16–33.

Mukhtar, T., & Zakaria, M. (2010). Budget deficit, money supply and inflation: The case of Pakistan. *Economic Trends and Economic Policy, 20*(122), 53–70.

Mupunga, N., & Le Roux, P. (2015). Analysing the effects of macroeconomic shocks on public debt in Zimbabwe. *Studies in Economics and Econometrics, 39*(3), 93–116. https://doi.org/10.1080/10800379.2015.12097287

Mupunga, N., & Ngundu, T. (2020). Escalating public debt levels and fiscal responses in Sub-Saharan African countries (AERC Research Paper No. 385). *African Economic Research Consortium*.

Njie, M., & Badjie, M. (2021). The effects of interest rate on economic growth: Further insights from The Gambia. *Journal of Economics and International Finance, 13*(2), 100–105. https://doi.org/10.5897/jeif2021.1127

Siele, R., & Serem, A. (2022). The effect of public debt on economic growth in Kenya. *The International Journal of Business & Management*. https://doi.org/10.24940/theijbm/2022/v10/i11/bm2211-024

Swamy, V. (2015). Government debt and its macroeconomic determinants: An empirical investigation. *Social Science Research Network (SSRN)*. https://doi.org/10.2139/ssrn.2601875

Trading   Economics.   (2023).   *Gambia   government   debt   to   GDP*.
https://tradingeconomics.com/gambia/government-debt-to-gdp
World   Bank.   (2022).   *International   debt   statistics   2022*.   World   Bank.
https://www.worldbank.org/en/programs/debt-statistics
World Economics. (2022). *Gambia debt-to-GDP ratio*. https://www.worldeconomics.com