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Original Article

Public Debt, Debt Servicing, and Fiscal Space in Developing Economies in Africa

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Abstract: *This study examines the dynamic relationship among public debt, debt servicing, and fiscal space in developing economies in Africa, with the objective of providing evidence to inform sustainable fiscal management and debt-policy decisions. The study uses annual macroeconomic data obtained from the International Monetary Fund and covers a panel of African developing economies over the study period. The empirical analysis employs the Panel Autoregressive Distributed Lag framework and its associated error-correction specification to distinguish between short-run dynamics and long-run equilibrium relationships among the variables. The findings indicate the existence of a stable long-run relationship among fiscal space, public debt, and debt servicing. The positive relationship between public debt and fiscal space, in the short term, suggests that government borrowing can enhance, at least for a period of time, the ability of governments to fund spending and cover any budget deficits. Nevertheless, the adjustment process shows us that the increased fiscal capacity created through debt-financed spending may not last forever, especially if the amount of debt being accumulated results in rising interest costs. Therefore, the findings of this study point out how important it is for countries to borrow responsibly, manage their debt effectively, and increase their domestic tax revenues so as to preserve fiscal space. This study adds to existing literature as it provides empirical evidence of the relationship between debt accumulation and fiscal capacity in African developing economies. Additional research could include other variables like institutional quality, composition of debt, exchange rate risk, and political economy variables to help explain fiscal space and debt sustainability in more detail.*

Keywords: *Fiscal Space, Public Debt, Debt Servicing, Debt Sustainability, Fiscal Policy, Domestic Revenue Mobilization, Macroeconomic Dynamics.*

1. INTRODUCTION

Fiscal space is an important factor that determines whether or not developing African countries can achieve macroeconomic stability and have some degree of fiscal policy autonomy (El Hassani & JERRY, 2026; Oyadeyi & Oyadeyi, 2026). Fiscal space can be defined as the capacity of a government to raise and use funds to fund government spending on public goods such as infrastructure, human capital development, etc., as well as respond to various forms of economic shock, all while maintaining the long-term sustainability of the country's finances and debt (Beaumont, 2026; Magande et al., 2026). The amount of fiscal space available is a product of many variables, including the total amount of public debt outstanding, the amount of money needed to service that debt, the ability of a government to generate revenues from its citizens, interest rates on government borrowing, fluctuations in exchange rates, and overall macroeconomic conditions (Bamidele, 2026; Okoth & Sekmen, 2026). When a country has sufficient fiscal space, it can effectively address both short-term economic/social problems and long-term development goals. Conversely, when a country lacks sufficient fiscal space, it will be difficult for the government to provide basic public services, let alone pursue development priorities.

Many African economies *now* face a significant fiscal burden as a result of rising public debt and associated debt servicing obligations (Sunday, 2026; Oluwagbenle et al., 2026). The issue goes beyond the amount of public debt; it also involves the amount of resources needed to service this debt. In particular, high interest payments, principal repayment obligations, refinancing costs, and exchange rate volatility may restrict the availability of resources for health, education, infrastructure, and other developmental programs (Ahmed, 2026; Elom & Nwobasi, 2026). This issue is even more pronounced in cases where governments are heavily dependent upon relatively expensive domestic and foreign borrowing, while at the same time having limited capacity to generate revenue domestically. Thus, increasing the level of debt servicing requirements may limit the fiscal

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flexibility of governments and create a "vicious cycle" in which governments are forced to borrow additional funds in order to meet existing financial commitments (Hasan et al., 2026; Zhang et al., 2026).

Fiscal space reduction has serious macroeconomic and developmental implications. Countries that have limited fiscal capacity will be less able to react to external financial shocks, economic downturns, commodity price changes, and climate disasters. Long-term fiscal pressure could lead to less public investment and insufficient funding for basic social services (Batizani, 2026; Olaniyi & Odhiambo, 2026). Additionally, high government borrowing costs can impact the development of domestic financial markets as they encourage financial institutions to purchase government securities instead of providing loans to private businesses (Kocha et al., 2026). These factors over time can negatively affect investment, employment, human capital development, infrastructure availability, and overall economic performance.

A large body of literature exists on the effects of public debt, debt sustainability, and economic growth on fiscal space; however, there are many areas that remain unexplored in relation to the effect of public debt as a dynamic dependent variable (Wesa & Sávai, 2026; Matabwa et al., 2026; Seghini, 2026). Most studies have focused on the level of aggregate debt and debt-to-GDP ratios. These types of studies do not take into consideration issues related to the availability of funds for debt service, such as high interest rates, short debt maturities, poor collection of revenues, exchange rate risks and differences between domestic and international debt (Ayaka & Mamman, 2025; Nyamadi, 2025). Therefore, there is a clear requirement for empirical studies that analyze the short-term and long-term effects of public debt and debt service requirements on fiscal space, specifically in relation to the structural and economic characteristics of developing countries in Africa.

This research fills a gap in our understanding of how public debt, debt service payments and available fiscal space are related over time in developing countries in Africa. The research examines both the long-term relationships among these variables, as well as the short-term fluctuations, based on empirical evidence from macroeconomic data and a dynamic panel econometric approach. This research provides support for improving debt management practices, increasing domestic revenue collections, developing effective fiscal plans, and conserving resources for public investments which will benefit citizens. Ultimately, this research supports policy options which will enable African governments to utilize public borrowing cautiously so they can maintain sufficient fiscal flexibility to promote sustainable long-term social and economic growth.

This research is organized into five consecutive chapters. Chapter One presents a discussion of the study's background, problem definition, identifying research gaps, objectives and the concept of fiscal space as the dependent variable. Chapter Two reviews the relevant literature and theoretical frameworks that support this research. Chapter Three describes the research methodology, data used, variables identified and the panel econometric models developed to assess the effects of various factors on fiscal space. Chapter Four presents the empirical results from estimating the model, diagnostic tests conducted on those estimates, and provides an explanation of how each factor affects fiscal space. Finally, Chapter Five provides a summary of the findings, conclusions drawn from the results, and evidence-based policy recommendations designed to enhance fiscal space and reduce fiscal pressures associated with high levels of public debt in developing African economies.

II. LITERATURE REVIEW

Myers (1977) and Krugman (1988), who developed the Debt Overhang Theory, have provided an excellent theoretical basis for understanding how public debt, debt service, and fiscal space relate to each other in African developing countries. The theory states that as public debt increases beyond what a country can reasonably expect to pay back, the expected burden of paying off that debt in the future reduces incentives for individuals and businesses to invest in new projects and reduces the government's ability to use its financial resources as it sees fit. Therefore, as African governments spend a larger portion of their revenue on debt service instead of investing in productive activities, the large amount of public debt could limit the government's fiscal space (Abubakar et al., 2025). Furthermore, as public debt grows beyond sustainable amounts, fears about future tax increases, high inflation rates, pressure on exchange rates and overall economic instability could deter private sector investments and slow down economic growth.

The theory also shows that the way in which public debt has an effect on the fiscal space of a country is mainly through the channels of paying back debt. When there is more debt, the payments made to pay off the interest and principal use up money that the government receives in revenue that would have been used to fund things like infrastructure development, education, health care, social welfare programs and other development projects. Therefore, there is a "displacement effect" created by using up resources that were originally intended for welfare-enhancing activities to meet debt obligations. In many developing African countries, this effect can be even larger because of high interest rates on loans, currency devaluations and the fact that most of these countries rely on borrowing in foreign currencies, which increases the cost of servicing external debt domestically. Furthermore, large amounts of domestic borrowing may crowd out private-sector lending as financial institutions choose to purchase government bonds rather than make loans to private companies; thus, reducing private sector investment and overall economic activity.

As such, the Debt Overhang Theory offers the conceptual framework to assess how public debt and debt service affect the fiscal space of developing countries in Africa. According to the theory, when public debt increases above sustainable limits, so too do debt-servicing requirements, thereby limiting the ability of governments to spend money at their discretion (Myers, 1977; Krugman, 1988). The theory supports the focus of this research on fiscal space as the main independent variable, while public debt and debt service represent two of the most significant explanatory variables. Therefore, the theory indicates that the maintenance of sustainable debt levels and the control of debt-servicing costs will preserve fiscal space, promote economic growth and allow African governments to fund development priorities while protecting long-term fiscal stability.

Research on the effects of growing public debt in African developing economies has shown that growing public debt may limit fiscal flexibility depending on a number of factors, including how much public debt a country has, what is going on economically in the country, and how well institutional structures function (Nutassey et al., 2025; Wesa & Sávai, 2026). In addition, research on Sub-Saharan Africa shows that there is a great deal of variation in the amount of fiscal space available to different countries. Countries that are experiencing greater fiscal distress tend to experience more pressure related to their ability to service their debts (Ekouala Makala, 2022; Sani, 2025; Kemoe & Lartey, 2022). According to the IMF's review of the region, the most important factor in determining appropriate levels of debt for a country to carry is the country's ability to pay off its debt obligations. The IMF estimates that the median debt anchor for the region is approximately 55 percent of GDP. However, the IMF also notes that several countries continue to have additional fiscal space to use for productive investments (Shabalala, Magazi, & Manamela, 2025). Empirical studies conducted in the Central African Economic and Monetary Community show that there exists a strong correlation between public debt and fiscal space. Nevertheless, the nature of the relationship varies based on the amount of debt being carried by a country and its capacity to adjust its fiscal policy (Drehmann et al., 2026).

Debt service represents an important avenue by which public debt reduces the amount of fiscal space available for developing priority areas (Elberry et al., 2023). Empirical studies of up to 35 Sub-Saharan African nations have demonstrated how the constraining effects of external debt service affect the allocation of public spending; thus, debt-servicing requirements can restrict the availability of resources for development priorities (Oluwagbenle et al., 2026). Recent evidence supports this concern: according to the World Bank, debt-service payments in Sub-Saharan Africa have grown significantly and have negatively impacted fiscal space and resilience to external economic shocks (Wesa & Savai, 2026). Furthermore, changes in the composition of African debt have worsened the problem, as governments in Sub-Saharan Africa are now borrowing more domestically due to tightened international financial markets. This shift creates more pressure on fiscal space through increased interest costs and the relationship between sovereign borrowing and domestic financial systems (Colak et al., 2025; Fischer & Storm, 2023).

The results of the empirical studies have demonstrated some large gaps in the existing body of empirical literature. Many of the previous studies focus on debt sustainability, debt-to-GDP ratios or fiscal balance rather than looking at public debt and debt service together as determinants of fiscal space. Furthermore, the variation in the types of debt, costs of financing, exchange rate exposures, and institutional capacities of different African economies makes it impossible to draw conclusions about country-specific fiscal challenges based only upon aggregate debt measures. Results from recent research suggest that debt relief can improve debt sustainability, while the effects of fiscal rules on African economies may differ depending on the specific institutional and fiscal conditions of each nation (Abubakar et al., 2025). Therefore, the present study contributes to the literature by directly examining the relationship between public debt, debt servicing, and fiscal space using panel econometric techniques capable of distinguishing short-run dynamics from long-run relationships across developing African economies.

III. DATA AND METHODOLOGY

A quantitative research design employing annual panel data is used to examine the dynamic relationships among public debt, debt servicing, and fiscal space in developing African economies. The panel data approach was selected because it can account for both differences among countries and how things change over time in regards to how governments manage money. Panel data is appropriate for analyzing African economies since there is great variation among these economies in terms of their structures and institutions related to debt management and government spending. Data used in this study are all secondary macroeconomic data collected by the International Monetary Fund (IMF) – World Economic Outlook (WEO) database and Government Finance Statistics (GFS). Both databases collect standardized and internationally comparable fiscal and macroeconomic indicators; therefore, the measurements remain consistent among different countries and throughout the period. The sample consists of selected developing African economies for the period 2000 to 2025, depending on data availability and completeness for the variables of interest. The resulting dataset constitutes a balanced panel with country-level cross-sections observed over time.

A) Model Specification

To capture the potential bidirectional and dynamic relationships among fiscal variables, the study specifies a system of three interrelated Panel Autoregressive Distributed Lag (Panel ARDL) models. Each key variable fiscal space, public debt, and

debt servicing is alternately treated as a dependent variable in separate equations. This framework allows for feedback effects consistent with fiscal sustainability theory.

The general functional form is expressed as:

$$Y_{it} = f(X_{it}) \text{ ---------- (1)}$$

Where Y_{it} denotes the dependent variable and X_{it} represents the vector of explanatory variables for country i at time t.

ARDL Model Specifications

Let FS_{it}, PD_{it}, and DS_{it} denote fiscal space, public debt, and debt servicing, respectively, for country i at time t. The three ARDL models are specified as follows:

Model 1: Fiscal Space Equation

$$FS_{it} = \alpha_i + \sum_{p=1}^{P} \beta_{ip} FS_{i,t-p} + \sum_{q=0}^{Q_1} \gamma_{iq} PD_{i,t-q} + \sum_{r=0}^{Q_2} \delta_{ir} DS_{i,t-r} + \varepsilon_{it} \text{ ---------- (2)}$$

This model examines the dynamic effects of public debt and debt servicing on fiscal space, with fiscal space serving as the dependent variable.

Model 2: Public Debt Equation

$$PD_{it} = \alpha_i + \sum_{p=1}^{P} \beta_{ip} PD_{i,t-p} + \sum_{q=0}^{Q_1} \gamma_{iq} FS_{i,t-q} + \sum_{r=0}^{Q_2} \delta_{ir} DS_{i,t-r} + \varepsilon_{it} \text{ ---------- (3)}$$

This model examines the dynamic relationship between public debt, fiscal space, and debt servicing, with public debt specified as the dependent variable.

Model 3: Debt Servicing Equation

$$DS_{it} = \alpha_i + \sum_{p=1}^{P} \beta_{ip} DS_{i,t-p} + \sum_{q=0}^{Q_1} \gamma_{iq} FS_{i,t-q} + \sum_{r=0}^{Q_2} \delta_{ir} PD_{i,t-r} + \varepsilon_{it} \text{ ---------- (4)}$$

The model investigates the dynamic relationship between debt servicing, fiscal space, and public debt, with debt servicing as the dependent variable.

B) ARDL Models with Error-Correction Terms

Let FS_{it}, PD_{it}, and DS_{it} denote fiscal space, public debt, and debt servicing, respectively, for country i at time t.

Model 1: Fiscal Space Equation

$$\Delta FS_{it} = \alpha_{1i} + \sum_{p=1}^{P-1} \phi_{1ip} \Delta FS_{i,t-p} + \sum_{q=0}^{Q_1-1} \beta_{1iq} \Delta PD_{i,t-q} + \sum_{r=0}^{Q_2-1} \gamma_{1ir} \Delta DS_{i,t-r} + \lambda_{1i} ECM_{1,i,t-1} + \varepsilon_{1it} \text{ ---------- (5)}$$

Where the error-correction term is:

$$ECM_{1,i,t-1} = FS_{i,t-1} - \theta_{11i} PD_{i,t-1} - \theta_{12i} DS_{i,t-1}$$

This model examines the short-run effects of public debt and debt servicing on changes in fiscal space, while the error-correction term captures the speed at which fiscal space adjusts towards its long-run equilibrium relationship with public debt and debt servicing.

Model 2: Public Debt Equation

$$\Delta PD_{it} = \alpha_{2i} + \sum_{p=1}^{P-1} \phi_{2ip} \Delta PD_{i,t-p} + \sum_{q=0}^{Q_1-1} \beta_{2iq} \Delta FS_{i,t-q} + \sum_{r=0}^{Q_2-1} \gamma_{2ir} \Delta DS_{i,t-r} + \lambda_{2i} ECM_{2,i,t-1} + \varepsilon_{2it} \text{ ---------- (6)}$$

Where:

$$ECM_{2,i,t-1} = PD_{i,t-1} - \theta_{21i} FS_{i,t-1} - \theta_{22i} DS_{i,t-1}$$

This specification captures the short-run dynamics of public debt in response to changes in fiscal space and debt servicing, while the error-correction term represents the adjustment of public debt towards its long-run equilibrium relationship with the other variables.

Model 3: Debt Servicing Equation

$$\Delta DS_{it} = \alpha_{3i} + \sum_{p=1}^{P-1} \phi_{3ip} \Delta DS_{i,t-p} + \sum_{q=0}^{Q_1-1} \beta_{3iq} \Delta FS_{i,t-q} + \sum_{r=0}^{Q_2-1} \gamma_{3ir} \Delta PD_{i,t-r} + \lambda_{3i} ECM_{3,i,t-1} + \varepsilon_{3it} \text{ ---------- (7)}$$

Where:

$$ECM_{3,i,t-1} = DS_{i,t-1} - \theta_{31i}FS_{i,t-1} - \theta_{32i}PD_{i,t-1}$$

This model examines the short-run dynamics of debt servicing in response to changes in fiscal space and public debt, while the error-correction term captures the adjustment towards the long-run equilibrium relationship.

C) Estimation Procedure

The empirical analysis follows several stages. First, descriptive statistics and correlation analysis summarize the data and assess preliminary relationships among variables, including potential multicollinearity. Panel unit root tests determine the order of integration, using the Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS), and Fisher-type Augmented Dickey-Fuller (ADF) tests. The Panel ARDL approach is suitable when variables are integrated of order zero, I(0), or order one, I(1), but not I(2). Panel cointegration tests by Pedroni and Kao assess the existence of a long-run equilibrium relationship among the variables. After confirming cointegration, the Panel ARDL model is estimated to derive both short-run dynamics and long-run coefficients. The negative value of the ECT indicates that there is convergence to long-term equilibrium. To determine if there are any statistical problems such as serial correlation, heteroskedasticity, multicollinearity, or cross-sectional dependence, we will perform diagnostic tests. We will use additional proxies for fiscal space, including primary balances and fiscal balances, to evaluate the robustness of our results. Pesaran et al. (1999) is an ideal method for us to employ in this research project as it allows us to account for heterogeneity in short-run dynamic processes while simultaneously providing a common long-run relationship between countries. Furthermore, it provides an opportunity to identify feedback relationships between different fiscal variables, which is important since public debt, debt service, and fiscal space are interrelated.

Table 1: Variable Measurement and Description

Variables	Symbols	Type of Variables	Operational Definition	Measurement/Proxy	Expected Relationship	Data Source
Fiscal Space	FS	Dependent Variable / Outcome Variable	The ability of government to mobilize financial resources and undertake public expenditure without compromising fiscal sustainability or increasing vulnerability to debt distress.	Measured using fiscal indicators such as overall fiscal balance, primary balance, and government revenue capacity. Higher fiscal balance and stronger revenue performance indicate greater fiscal space.	N/A	IMF World Economic Outlook (WEO); IMF Government Finance Statistics (GFS)
Public Debt	PD	Main Explanatory Variable	The accumulated financial obligations of the government arising from domestic and external borrowing activities. It reflects the level of indebtedness and debt burden faced by an economy.	General government gross debt as a percentage of GDP.	Negative (-) effect on fiscal space; Positive (+) effect on debt servicing	IMF World Economic Outlook (WEO)
Debt Servicing	DS	Main Explanatory Variable	The financial obligations associated with servicing accumulated government debt, including interest payments and repayment commitments.	Interest payments and debt service obligations measured as a percentage of GDP or government revenue.	Negative (-) effect on fiscal space; Positive (+) effect on public debt	IMF Government Finance Statistics (GFS); IMF WEO

Source: *Author's Compilation (2026)*

IV. PRESENTATION, ANALYSIS, AND DISCUSSION OF RESULTS

The first part of this section describes the basic descriptive statistics for the variables; it provides a general overview of how these variables were distributed during the time frame covered by the study. Following this, diagnostic tests including correlation and multicollinearity assessments were performed to ensure that each variable was appropriate for inclusion in subsequent econometric estimations. Additionally, unit root tests were used to examine whether or not each of the variables had stationary behavior (i.e., whether each variable had a constant mean, variance, etc.) over time. Given the nature of the variables being examined and the results of the unit root tests, the ARDL method was chosen as the most suitable technique to investigate both the short- and long-run relationships existing between public debt, debt service payments and fiscal space. Once an

appropriate model was selected based upon established information criteria, the ARDL bounds testing approach was employed to determine if there existed a long-run relationship between public debt, debt service payments and fiscal space.

The estimated coefficients for both short-term and long-term are presented and evaluated with respect to the theoretical expectations and objectives of the research. Diagnostic and stability testing is conducted on the model results to assess the reliability, adequacy and stability of the model. The results are further evaluated in terms of empirical studies and theoretical arguments supporting the relationship between public debt, debt service and fiscal space.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
fs	42	6.447	4.638	1.046	23.797
pd	42	7.615	7.665	.059	38.034
ds	42	9.156	9.267	.124	44.315

Source: *Author's Computation (2026)*

Table 2 displays the descriptive statistics for fiscal space (FS), public debt (PD), and debt servicing (DS). The statistics presented above provide information about how much fiscal space, public debt and debt service were available, where it was typically located (central tendency) and how far away from that average position the data point could fall (variability), during the time the research took place. Fiscal space had a great deal of variation over the years. The wide range of values around the average value for fiscal space and the difference between the lowest and highest value for fiscal space demonstrate that there was no consistency in fiscal space. This may have been caused by changes in the government's approach to fiscal policy, how much money the government collected from taxpayers, what the government needed to spend money on and how easily the government could borrow money. Public debt was also very variable during the time the research took place. The amount of variation indicates that public debt levels did not remain consistent during this time. The large range of public debt values recorded also suggests that the government changed its borrowing behavior frequently, as well as accumulating large amounts of debt. Finally, debt service was also quite variable during the time the research took place. The relatively high degree of variation indicates that the government's responsibility to repay its debt fluctuated greatly during this time. There are many reasons why this variability may exist; some include changes in the size and composition of public debt, changes in interest payments due on public debt, fluctuations in exchange rates and changes in the amount of debt being repaid.

Based on the descriptive statistics, there are major changes in fiscal space, public debt and debt service over the entire duration of the research. These changes in the three variables suggest early evidence of changes in the fiscal and debt environments, indicating the need for additional econometric studies. In particular, the changes indicate the need to examine how the relationship between public debt, debt service and fiscal space evolves dynamically using the ARDL method, as it can distinguish between short-term adjustments and long-term relationships.

Table 3: Pairwise correlations

Variables	(1)	(2)	(3)
(1) fs	1.000		
(2) pd	0.771*	1.000	
	(0.000)		
(3) ds	0.004	-0.024	1.000
	(0.982)	(0.878)	

Source: *Author's Computation (2026)*

A) Pairwise Correlation Analysis

The pairwise correlation matrix shows how fiscal space (FS), public debt (PD), and debt servicing (DS) are related and how strongly they move together. These results give an early look at how the variables are connected and whether there might be multicollinearity among them. There is a significant positive relationship between fiscal space and public debt, which suggests that when there is a change in public debt, there tends to be an associated change in fiscal space throughout the duration of the study. This positive relationship could be a result of the interactions between government borrowing and fiscal space available. It is also important to note that although there is a correlation, this does not indicate that one variable causes the other, but rather illustrates the similarity in their movements.

The association between fiscal space and debt service is weak and does not appear to be statistically relevant. Thus, there is no direct, rapid association between changes in debt service and changes in fiscal space in the current study. There is also a weak association between public debt and debt service, which is not statistically relevant either. Therefore, the associations between changes in public debt and changes in debt service are not directly observable in the data. The results show that fiscal space and public debt are more closely related, while debt servicing has weak links with both. The weak associations with debt servicing

suggest there is no serious multicollinearity problem among the variables. However, the correlation matrix is only a first check and does not show relationships that might come from lagged variables. Because of this, the correlation results should be reviewed together with the VIF results and other tests when deciding if the ARDL model is suitable and reliable.

Table 4: Panel Unit Root Test Results

Variables	Levin-Lin-Chu (LLC)	p-value	Im-Pesaran-Shin (IPS)	p-value	ADF-Fisher (χ^2)	p-value	Hadri LM (z)	p-value	Order of Integration
FS	Level 3.7045	0.9999	3.1468	0.9992	233.8742	0.0000	56.6040	0.0000	
	First Difference -6.5410	0.0000	-13.0074	0.0000	681.4112	0.0000	-4.8697	1.0000	I(1)
PD	Level 0.1918	0.5760	-0.2353	0.4070	106.2879	0.0507	43.6619	0.0000	
	First Difference -10.9122	0.0000	-15.6952	0.0000	833.7955	0.0000	-3.7824	0.9999	I(1)
DS	Level -0.8010	0.2116	-0.1168	0.4535	140.0920	0.0001	43.2810	0.0000	
	First Difference -12.6317	0.0000	-14.2770	0.0000	882.4975	0.0000	-4.4510	1.0000	I(1)

Source: *Author's computation (2026)*

B) Interpretation of Panel Unit Root Test Results

Panel unit root tests were employed to establish the stationarity characteristics and integration orders of public debt (PD), debt servicing (DS), and fiscal space (FS). The analysis utilized four complementary procedures: the Levin–Lin–Chu (LLC), Im–Pesaran–Shin (IPS), ADF-Fisher, and Hadri LM tests. The application of multiple testing procedures enhances the robustness of the assessment by accounting for differences in their underlying assumptions regarding unit roots and stationarity across cross-sectional units. In particular, the LLC and IPS tests, the ADF-Fisher procedure, and the Hadri LM test differ in their respective null hypotheses and assumptions about the persistence of individual panel series. The results for fiscal space (FS) at levels reveal some inconsistencies across the tests. The LLC and IPS procedures fail to reject the null hypothesis of a unit root, whereas the Hadri LM test rejects its null hypothesis of stationarity. Although the ADF-Fisher test provides evidence against the presence of a unit root at levels, the combined results do not establish sufficiently consistent evidence to classify fiscal space as stationary in levels. However, the findings become more consistent after first differencing. The null hypothesis that the series has a unit root can be rejected based on the LLC, IPS, and ADF-Fisher tests. However, the Hadri LM test cannot reject the null hypothesis of stationarity. These results indicate that fiscal space is non-stationary in levels, yet is stationary after taking the first difference. Therefore, the FS variable would be classified as integrated of order one (I(1)).

A similar result occurs for Public Debt (PD). The level estimates from both the LLC and IPS tests do not provide enough evidence to support the unit root null hypothesis, whereas the Hadri LM test provides enough evidence to support the non-stationarity null. The ADF-Fisher test does provide some weaker evidence against a unit root at levels, but there is no consistent evidence for level stationarity across all tests. However, when the series are first differenced, the test results are consistent with stationarity: the LLC, IPS and ADF-Fisher procedures support the stationarity null hypothesis; whereas the Hadri LM test does not support the stationarity null. Therefore, Public Debt is identified as I(1), which means that after differencing the series once, it will be stationary. Results for Debt Servicing (DS) also suggest that it is non-stationary at levels. More specifically, the LLC and IPS procedures do not provide enough evidence to support the unit root null hypothesis, whereas the Hadri LM procedure does provide enough evidence to support the non-stationarity null. Although the ADF-Fisher procedure suggests that Debt Servicing is stationary at levels, there is no consistent support for this finding across the other procedures. At first differences, the LLC, IPS, and ADF-Fisher procedures provide enough evidence to support the stationarity null hypothesis, whereas the Hadri LM procedure does not provide enough evidence to support the stationarity null. The combined evidence therefore supports the classification of debt servicing as an I(1) variable.

The panel unit root results indicate that public debt, debt servicing, and fiscal space are integrated of order one. None of the three variables is identified as integrated of order two, I(2), based on the reported tests. This outcome is important for the subsequent econometric analysis because the conventional autoregressive distributed lag (ARDL) bounds-testing approach accommodates variables integrated of order zero, I(0), and order one, I(1), but is not applicable when any variable is integrated of order two. Therefore, the findings establish a preliminary basis for proceeding with the ARDL bounds-testing procedure to investigate the existence of a long-run relationship among public debt, debt servicing, and fiscal space, followed by the estimation of the associated long-run coefficients and short-run adjustment dynamics.

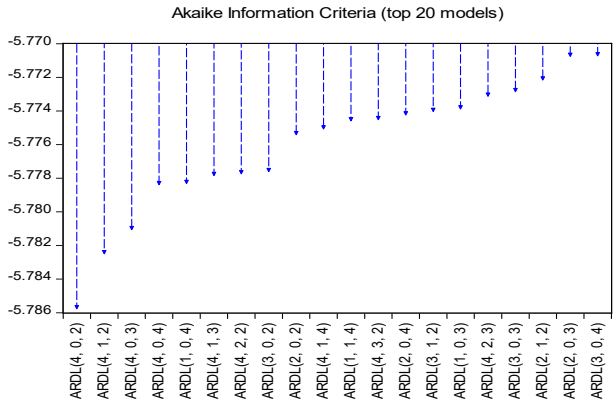


Figure 1. Determination of Optimal Lag Length

C) Optimal ARDL Model Selection Based on the Akaike Information Criterion

Figure 1 presents the Akaike Information Criterion (AIC) values for the leading Autoregressive Distributed Lag (ARDL) model specifications considered in the analysis. The ARDL (4, 0, and 2) specification is the preferred model based on the AIC criterion. The AIC criterion was used for selecting models since it offers a compromise between how well the model fits the data and how simple the model is, with lower scores indicating a more suitable model. Some of the other ARDL specifications considered had similar performance and their AIC values were close to the AIC value of the ARDL (4, 0, and 2) specification. This suggests that the leading specifications provide broadly comparable representations of the underlying dynamic relationship. Nevertheless, the ARDL (4, 0, 2) model is retained because it achieves the minimum AIC among the models considered, thereby providing the most favourable balance between explanatory performance and model complexity according to the selected information criterion.

The ARDL specification chosen demonstrates how the dynamics of fiscal space are most accurately represented through the use of four lags of the dependent variable, no lag of the first explanatory variable and two lags of the second explanatory variable. The choice of lag structures provides the ability to represent the persistent characteristics of fiscal space as well as its delayed reaction to changes in the explanatory variables. Such a dynamic structure is particularly appropriate where fiscal policy effects may not materialize immediately but may unfold over subsequent periods. The selection of the ARDL (4, 0, and 2) specification provides an appropriate basis for examining both the short-run dynamics and the long-run relationship among fiscal space, public debt, and debt servicing. The use of multiple lagged periods of fiscal space provides a measure of how persistent fiscal conditions are. The addition of distributed lags of other explanatory variables provides a mechanism by which the study can include the time lag that may exist between when a policy change occurs and when its effects on the economy are realized.

The ARDL (4, 0, 2) specification was chosen because of its lower AIC value. However, model selection is not solely determined by information criteria. The suitability of the chosen specification must be supported by post-estimation diagnostic and stability testing. Post-estimation diagnostic and stability tests include serial correlation tests, heteroskedasticity tests, residual property tests, parameter stability tests and overall specification adequacy tests. The theoretical consistency and economic plausibility of the estimated relationships should also be considered. On this basis, the ARDL (4, 0, and 2) specification is adopted as the preferred model for the subsequent empirical analysis. Its selection reflects the most favourable trade-off between model fit and parsimony among the specifications examined, while the subsequent diagnostic and stability tests provide additional evidence regarding the reliability and adequacy of the estimated model.

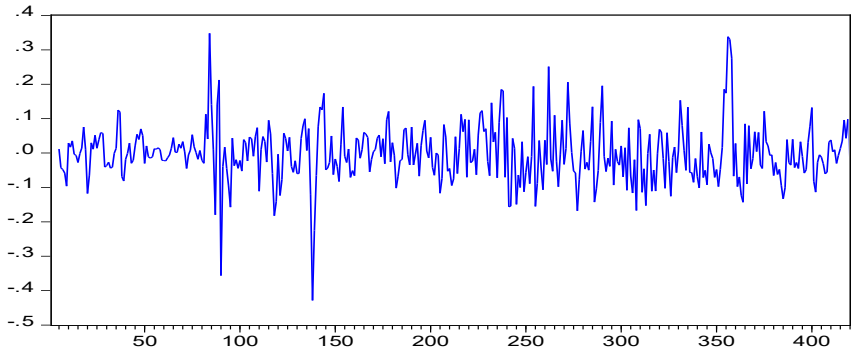


Figure 2. Test for Cointegration of Variables

D) Interpretation of the Cointegration Graph

Figure 1 presents the graphical behaviour of the cointegrating residuals over the study period. The residual series fluctuates around a relatively stable equilibrium level, with movements occurring on both sides of zero and without exhibiting a persistent upward or downward trend. This pattern suggests that the deviations from the estimated long-run relationship are temporary rather than permanent. In particular, periods of relatively large positive and negative deviations are followed by movements back toward the equilibrium level, indicating a tendency toward mean reversion. The observed mean-reverting behaviour provides preliminary graphical evidence of a stable long-run relationship among the variables included in the model. The deviations from the trend line at different times during the sampling period may represent short-term changes in some of the factors influencing the variables. However, the residual values returned to their long-term equilibrium levels, suggesting that although the shocks caused short-term fluctuations, they did not alter the long-term relationship between the variables. This is consistent with what would be expected based on cointegration theory. Cointegration states that two or more variables which are individually nonstationary can have a stable long-term relationship. Nevertheless, the graphical evidence should not be interpreted as sufficient proof of cointegration on its own. Formal econometric testing is necessary to establish the statistical significance of the long-run relationship. Therefore, the graphical evidence is complemented by the ARDL bounds testing procedure, which provides the formal basis for determining whether a long-run cointegrating relationship exists among the variables.

Table 5: Estimates of Panel ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FS(-1)	0.754380	0.033895	22.25631	0.0000
FS(-2)	-0.003102	0.013506	-0.229670	0.8185
FS(-3)	-0.038016	0.013274	-2.863920	0.0044
FS(-4)	0.019025	0.008254	2.304994	0.0217
DS	0.024813	0.006086	4.077001	0.0001
PD	0.032266	0.007853	4.108629	0.0000
PD(-1)	0.896167	0.012507	71.65401	0.0000
PD(-2)	-0.665055	0.031885	-20.85826	0.0000
C	-0.024746	0.009519	-2.599597	0.0097
R-squared	0.999585	Mean dependent var		3.436081
Adjusted R-squared	0.999577	S.D. dependent var		0.644803
S.E. of regression	0.013267	Akaike info criterion		-5.785656
Sum squared resid	0.071639	Schwarz criterion		-5.698453
Log likelihood	1212.416	Hannan-Quinn criter.		-5.751176
F-statistic	122483.3	Durbin-Watson stat		1.795262
Prob(F-statistic)	0.000000			

Source: *Authors Computation (2026)*

E) Error Correction Model and Long-Run Relationship

The Panel Autoregressive Distributed Lag (ARDL) estimates presented in Table 5 reveal significant short-run dynamics in fiscal space (FS). The lagged values of fiscal space indicate a considerable degree of persistence in fiscal conditions. The first lag is positive and statistically significant; suggesting that fiscal space in the preceding period positively influences its current level. The second lag is statistically insignificant, whereas the third lag is negative and significant and the fourth lag is positive and significant. The dynamic nature of how previous fiscal positions influence subsequent periods is demonstrated in this pattern. It is clear from the above that there is no uniform effect of earlier fiscal positions on future periods. Instead, the process of adjusting the fiscal position takes place over time in response to past borrowings, changes in revenues, debt service payments, and expenditures. The results also support the dynamic approach taken in the Panel ARDL framework proposed by Daadaa and Hdhili (2026), as it allows for both short-term adjustments and differences in the dynamic properties of each panel unit. The alternating signs of the lagged fiscal-space coefficients may reflect delayed fiscal adjustments and the interaction between previous fiscal positions and subsequent budgetary decisions. However, this interpretation should be treated cautiously because the statistical significance of individual lag coefficients does not, by itself, establish the underlying economic mechanism Pesaran *et al.* (1999).

Debt servicing (DS) exhibits a positive and statistically significant short-run effect on fiscal space. The positive coefficient suggests that increased debt servicing results in increased fiscal space in the same period, assuming everything else remains the same. A potential reason why this occurs is that nations with more effective revenue generation, better liquidity management or improved fiscal performance may have a greater capacity to pay back their debt while retaining the ability to borrow. Therefore, the positive coefficient may partially represent the fiscal capacity that allows nations to repay their debt instead of a positive causal relationship between debt repayment and increased fiscal space. In contrast to Olaniyi and Odhiambo (2026), who used

an ARDL model to evaluate the impact of external debt repayment on capital accumulation in Ghana and found that external debt repayment had a negative impact on capital accumulation in both the short-term and long-term, our results indicate that the positive coefficient does not imply a causal link between increased debt repayment and increased fiscal space. Olaniyi and Odhiambo's results suggest that increased debt-service obligations could restrict investment due to the increased fiscal burden imposed by the accumulation of debt. Additionally, the International Monetary Fund (2022) stated that increasing debt-service burdens decrease the amount of fiscal space available for development and macroeconomic stabilization. Onyekachi-Onyele et al. (2024), in their research regarding low-income countries, also discovered that debt servicing crowds out public investment, and that this negative effect becomes stronger as debt-service burdens grow. Therefore, the positive short-term relationship we found between debt servicing and fiscal space is contrary to the findings that demonstrate expenditure limitations created by debt servicing. Possible reasons for these differences include differences in how fiscal space was measured, differences in types of debt and their maturity dates, differences in the fiscal characteristics of each country included in each study, and differences in the length of time used to measure the effects of debt servicing. Consequently, the positive coefficient cannot be viewed as proof that increased debt servicing leads to increased fiscal space; rather, it may be reflective of current fiscal capacity or other unique characteristics of each country.

Public debt (PD) has a positive and significant contemporaneous impact on fiscal space. Therefore, an increase in borrowing will increase the government's financial capacity to spend money on public projects, development programs, or respond to economic crises. The first lagged value of public debt is also positive and statistically significant. This indicates that the initial relationship continues to exist after the first year. On the other hand, the second lagged value of public debt is negative and statistically significant. This implies that the relationship between public debt and fiscal space reverses as the effects of borrowing develop. It is consistent with the idea that while borrowing initially helps to alleviate financing constraints, it will eventually generate repayment obligations, interest expenses, and refinancing needs that limit the ability of governments to be flexible financially. The results reported above are consistent with the International Monetary Fund's (2022) identification of channels through which excessive levels of indebtedness can negatively affect fiscal space and macroeconomic stability. These channels include debt overhang, crowding out effects, and increasing debt service obligations. Furthermore, Esaa and Bal (2026) demonstrated that the effect of external debt on economic growth depends on the extent of indebtedness, and debt overhang occurs only within certain ranges of indebtedness instead of being consistently negative at every level of indebtedness. While economic growth is not directly related to fiscal space, their findings provide support for the broader contention that the implications of borrowing are dependent upon both the size of the debt accumulated and whether it is sustainable. Additionally, Gyeke-Dako et al. (2026) documented that the long-term effect of external debt on private investment in Ghana was negative; whereas the short-term effect was positive. Their study provides evidence that the implications of borrowing can alter as time progresses. Taken together, these studies provide a useful basis for interpreting the changing signs of the public-debt coefficients in the present study. The results suggest that borrowing may provide immediate fiscal flexibility, while its subsequent implications depend on the productivity of financed expenditure, the government's revenue-generating capacity, and the cost of servicing accumulated obligations. Nevertheless, because the dependent variable in this study is fiscal space, rather than economic growth or capital formation, the comparison with previous studies should be understood as evidence of related fiscal mechanisms rather than direct equivalence between the estimated relationships.

F) Long-Run Effects

The evidence from the long-run relationship indicates that fiscal space, public debt, and debt servicing are systematically linked over time. The Bounds test rejects the null hypothesis of no levels relationship, confirming the existence of a long-run equilibrium relationship among the variables. The results of this study indicate that the short-term fluctuations in fiscal space are related to a longer term equilibrium relationship, and do not represent totally independent or transitory relationships. The large negative error correction term provides additional support for the presence of a longer term adjustment process. Once a country's fiscal space deviates from its long term path, it will adjust back toward that path over time. However, the adjustment process does not occur instantaneously nor is it permanent; a percentage of the previous periods disequilibrium is corrected in every subsequent period. Thus, the fiscal imbalances created by increases in both public debt and debt service will be gradually absorbed by the fiscal adjustment process.

The long-term relationship is especially relevant for assessing whether fiscal space is sustainable. While public debt can increase fiscal capacity in the short term, the long-term equilibrium relationship shows that fiscal space is limited by both the overall process of accumulating debt and the need to service that debt. As a result, the extent to which governments are able to develop fiscal space via borrowing is contingent on their ability to meet current funding requirements and maintain debt service obligations over time. The results suggest there are two distinct impacts of public debt on fiscal space; one occurring in the short term and the other in the longer term. For the short term, there is a positive relationship between public debt and fiscal space, which means that borrowing could provide governments with extra funding and temporary fiscal flexibility. Conversely, there

appears to be a negative relationship in the long term, indicating that any positive effects from increased borrowing will be offset by the accumulating costs associated with servicing the debt.

In the long term, fiscal space, public debt and debt service are all linked to one another by means of a stable equilibrium. The large error correction mechanism provides evidence that deviations from the equilibrium will eventually be corrected. As such, any increase in fiscal space through the use of additional borrowed funds does not necessarily imply an improvement in the underlying fiscal sustainability (Abubakar et al., 2025). Instead, the long-term status of fiscal space is determined by whether the accumulation of debt and related servicing requirements remain compatible with the government's ability to pay off its obligations in the future. It appears as though public debt can offer short-term fiscal flexibility; however, it can also impose long-term restrictions on fiscal space when the level of borrowing is excessive or continued. This distinction is critical to fiscal policy in developing countries as they tend to borrow to fund development projects and respond to fiscal pressures. Therefore, sustainable fiscal management requires policymakers to weigh the immediate advantages of debt-financed expenditures against the longer-term consequences of debt accumulation and debt servicing for fiscal space.

Table 6: Estimates of Error Correction Model (ECM)

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(FS(-1))	0.022092	0.008382	2.635647	0.0087
D(FS(-2))	0.018990	0.008423	2.254496	0.0247
D(FS(-3))	-0.019025	0.008175	-2.327160	0.0204
D(PD)	0.032266	0.007804	4.134794	0.0000
D(PD(-1))	0.665055	0.031663	21.00390	0.0000
CointEq(-1)*	-0.267712	0.032275	-8.294747	0.0000
R-squared	0.973875	Mean dependent var		0.002679
Adjusted R-squared	0.973556	S.D. dependent var		0.081287
S.E. of regression	0.013219	Akaike info criterion		-5.800079
Sum squared resid	0.071639	Schwarz criterion		-5.741944
Log likelihood	1212.416	Hannan-Quinn criter.		-5.777092
Durbin-Watson stat	1.795262			

Source: ** p-value incompatible with t-Bounds distribution.*

Table 7: F-Bounds Test

		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	17.07485	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Source: *Authors computation (2026)*

G) Interpretation of the Error Correction Model and Bounds Test

The Error Correction Model (ECM) results provide evidence of significant short-run dynamics and a stable long-run relationship among fiscal space, public debt, and debt servicing. The statistically significant and negative error-correction term confirms that deviations from the long-run equilibrium are corrected over time, indicating that the variables are linked by a systematic adjustment mechanism. The negative value of the error correction coefficient is statistically significant. It therefore meets the convergence requirements for the error-correction model. Therefore, when fiscal policy deviates from its long term trend after being impacted by a fiscal shock, a portion of the deviation is corrected in the next time period (Ifeacho, 2026; Vajrapatkul & Vajrapatkul, 2025). The correction process is slow rather than immediate, indicating that it will take some time for fiscal policies to revert to their long term trends after changes occur in the level of public debt and the debt service payments associated with this public debt. Thus, the significance of the error correction coefficient supports the idea that the adjustment processes that take place within the fiscal sector are stable.

The short-term effects of fiscal space suggest that there is some degree of persistence in fiscal space. Specifically, changes in fiscal space in earlier periods have a strong effect on changes in fiscal space in subsequent periods; however, the type of effect depends upon the length of time that passed since those changes occurred. These findings imply that fiscal condition is not only dependent upon what happens today, but it is also affected by past fiscal adjustments and shocks. The fact that we observe both

reinforcing and correcting lagged effects is consistent with the dynamic nature of how fiscal adjustments work in developing countries. Many times, the consequences of making fiscal policy decisions will take many years to fully develop. Public debt appears to have a positive and statistically significant short-term effect on fiscal space. It seems as though as public borrowing increases, so too does the amount of fiscal capacity available to the government. Public borrowing can provide additional resources to fund public expenditures, development programs, fill financing gaps, respond to economic shocks, etc. Additionally, the positive effect of public borrowing seems to continue into subsequent periods, suggesting that the fiscal effects of borrowing may appear at a later date.

On the other hand, the short term positive relation between public debt and fiscal space must be evaluated with care. A higher level of fiscal space created through additional borrowing does not automatically imply a better long term fiscal position or fiscal sustainability. It may simply be a reflection of the ability to finance some of its current needs for a short period of time using borrowed funds, which will eventually have to be paid back and require interest payments. Therefore, while there are many immediate fiscal benefits of borrowing, there are also long term limitations on government spending and fiscal flexibility.

H) Bounds Test for Long-Run Relationship

The Bounds test provides strong evidence of a long-run relationship among fiscal space, public debt, and debt servicing. The calculated F-statistic exceeds the upper-bound critical values at all conventional significance levels. Accordingly, the null hypothesis of no levels relationship is rejected. The results of this study suggest that there exists a long-term statistically significant relationship between the variables. In addition to the results from the bounds testing approach, the negative and statistically significant error correction coefficient also supports the presence of cointegration. Thus, while the public debt and/or public debt service shock could affect the short-term availability of fiscal space, such changes in the short-term will take place as part of the overall long-term equilibrium framework. Therefore, any short-term deviation from the long-term equilibrium position will be corrected through the process of adjusting back towards the long-term equilibrium position.

The results indicate that there is a significant short-term link between public debt and fiscal space, however, the long-term relationship between public debt, debt service, and fiscal space is based upon a stable equilibrium. In addition to indicating that public debt allows governments to have some increased fiscal space in the short-term, the findings show that the ability of governments to maintain their increased fiscal space will depend on the long-term effects of accumulating debt and the costs of servicing that debt. These findings also carry implications for how developing nations manage their fiscal policies. Borrowing provides governments with funds to spend on public goods and services and responds to financial pressure; however, excessive and/or consistent use of debt could limit developing nations' ability to utilize their fiscal flexibility as they face greater debt service costs. Maintaining adequate fiscal space therefore requires a balance between the short-term financing benefits of public borrowing and its longer-term implications for debt sustainability. Fiscal policy should consequently focus not only on expanding immediate financing capacity but also on ensuring that borrowing remains consistent with sustainable debt dynamics and the government's capacity to meet future obligations.

I) Residuals Diagnostics

Table 8: Diagnostic Tests for the Estimated Model

Diagnostic Test	Test Statistic	P-Value	Decision	Conclusion
Serial Correlation LM (Lag 4)	5.5875	0.2321	Fail to Reject H0	Serial correlation not present
Residual Heteroskedasticity	5.3431	0.7204	Fail to Reject H0	Heteroskedasticity not present
Joint Jarque–Bera Normality	21,916.88	0.0000	Reject H0	Residuals are not normally distributed
Ramsey RESET	2.1967	0.1391	Fail to Reject H0	No functional-form misspecification

Source: *Author's computation (2026) from EViews output.*

J) Interpretation of the Diagnostic Tests

The diagnostic tests in table 6 evidence provide that the estimated ARDL model is generally well specified and suitable for subsequent analysis. The Breusch–Godfrey serial correlation LM test indicates that the null hypothesis of no serial correlation cannot be rejected at the conventional 5% significance level. This implies that the residuals do not exhibit statistically significant serial correlation. The reason why serial correlation is important is that if there was still some level of serial correlation in the residuals, it might be an indication that the ARDL model has not included all of the relevant dynamic information. As such, the finding indicates that the chosen dynamic specification does capture the temporal dependency within the model.

The Harvey heteroskedasticity test does not reject the null hypothesis of homoskedasticity (constant variance of the error term) at a 5% level of significance. This means that we cannot find any statistical proof that the residuals are heteroskedastic. We may conclude that the variance of the error term appears to remain constant across all observations within the sample. As with the absence of heteroskedasticity, we will have greater confidence in the reliability of our estimated standard errors and therefore in any statistical inference that we make based on the model.

On the other hand, the Jarque-Bera normality test rejects the null hypothesis that the residuals are normally distributed at the 5% significance level, which suggests that the residuals deviate significantly from a normal distribution. The finding suggests that the distribution of the model residuals does not conform to the normality assumption. However, the rejection of residual normality does not, by itself, imply that the ARDL model is misspecified or that the estimated long-run relationship is invalid. In particular, with a sufficiently large sample, the asymptotic properties of ARDL estimation mean that departures from normality may be less consequential for the consistency of the coefficient estimates than problems such as serial correlation, heteroskedasticity, model instability, or inappropriate treatment of the integration properties of the variables. Consequently, the non-normality finding should be acknowledged as a diagnostic limitation but interpreted alongside the other specification and stability tests.

The Ramsey RESET test fails to reject the null hypothesis of correct functional specification at the 5% significance level. This suggests that there is no statistically significant evidence of functional-form misspecification in the estimated model. More specifically, the result does not provide evidence that important nonlinear transformations, omitted functional components, or additional powers of the fitted values are required to adequately represent the underlying relationship. The finding therefore supports the appropriateness of the functional form adopted in the ARDL specification.

The diagnostic results indicate that the estimated ARDL model does not suffer from serial correlation, heteroskedasticity, or functional-form misspecification. The only identified diagnostic concern relates to the normality of the residuals. Nevertheless, the absence of the other major residual problems provides substantial support for the adequacy of the estimated model. The normality result should therefore be reported transparently but should not be interpreted in isolation as evidence that the model is unsuitable. Taken together, the diagnostic evidence suggests that the estimated ARDL specification provides a reasonably reliable basis for examining the short-run and long-run relationships among the variables, subject to the findings from the unit-root, bounds testing, parameter stability, and other relevant robustness diagnostics.

V. CONCLUSION, RECOMMENDATIONS, AND POLICY IMPLICATIONS

This study examined the dynamic relationship between public debt, debt servicing, and fiscal space in developing economies in Africa using annual macroeconomic data obtained from the International Monetary Fund (IMF). The Panel Autoregressive Distributed Lag (ARDL) method was utilized to determine the short-term and long-term associations between fiscal space, public debt, and debt service. The study's results suggest that there exists a long-term association between the three variables. This indicates that fiscal space, public debt, and debt service have a dynamic association with each other in the long term. In addition, the study's results indicate that there exists a positive association between fiscal space and public debt in the short-term. This suggests that public debt provides governments with fiscal capacity to spend, fill funding deficits, respond to shocks to the economy, and fund developmental projects. Although public debt provides governments with a short-term benefit in terms of fiscal capacity, it does not imply that increased public debt results in improved fiscal sustainability. Public debt also results in future obligations for principal and interest payments. Finally, the study's results indicate that errors in the long-term equilibrium are corrected over time.

The researchers found that public debt may be a useful means of financing for developing countries in Africa if it is taken out in a responsible manner and used productively. The ability of public debt to provide long-term fiscal stability is primarily determined by whether the money borrowed is used productively, whether the country has the potential to generate its own revenue, how well it manages its public debt, and whether it will have the funds to pay off its future debt service obligations. Therefore, policymakers should not be concerned about eliminating public debt; rather they need to ensure that the debt they take on is consistent with their overall fiscal framework and used to support productive economic activity. Additionally, debt management agencies need to develop medium- and long-term debt strategy plans based upon such factors as the length of time until the debt matures, the interest rates associated with the debt, the currency composition of the debt, the potential risk of refinancing the debt, and the estimated amount of money that will be required to meet future debt service obligations. In addition, debt management agencies should regularly conduct debt sustainability assessments and fiscal risk assessments to inform decision making regarding significant borrowing actions. Lastly, the researchers emphasized the need to improve domestic revenue generation and increase the efficiency of public expenditures. Governments can increase their revenue generated domestically by broadening their tax base, enhancing their tax administration and compliance efforts, decreasing tax evasion and avoidance, and implementing appropriate digital revenue generation systems in order to decrease their reliance on borrowing. Additionally, public resources should be allocated to those projects and programs that generate high levels of economic and social returns through rigorous project evaluation, transparent procurement procedures, effective project implementation, and ongoing monitoring. By increasing the efficiency of public expenditures, governments can generate additional fiscal space without necessarily having to increase taxes or public debt.

The potential for debt-servicing pressures to emerge should be clearly identified as part of the overall process of developing a fiscal plan. It will be important for governments to effectively manage the risk associated with refinancing, interest

rate changes and foreign exchange fluctuations; as well as identifying suitable options for improving the length of time that debt is outstanding (maturity) and its structure. Coordination between ministries of finance, debt management units, central banks and other key agencies involved in fiscal matters is critical to ensure that there are consistent linkages between borrowing activities, fiscal policies, monetary conditions and the long term sustainability of debt. In addition to managing risks associated with debt, it will be equally important for governments to develop "fiscal buffers" during times of strong economic growth. These buffers can help protect the economy from unexpected events or shocks and therefore limit the need for emergency borrowing. Finally, there needs to be greater transparency and accountability in relation to government borrowing. To achieve this, governments need to report on a regular basis on the total amount borrowed, the total amount currently owed, the total amount required to service existing debt obligations and the manner in which funds obtained via borrowing have been utilized. Practically speaking, this means that when evaluating the use of additional borrowing, consideration should be given not only to meeting immediate funding requirements, but also to the impact that such borrowing will have on future revenues, expenditure capabilities, debt servicing obligations and ultimately the sustainability of fiscal policy. Additional areas of investigation that would be beneficial would include analysis of the composition of debt, i.e., whether it consists primarily of domestic or external debt, whether it was obtained on concessional or commercial terms and whether it consists mainly of short-term or long-term obligations. Additionally, investigations into how exchange rate and interest rate conditions, institutional quality, political economy issues and non-linear/threshold relationships affect fiscal space in African developing economies would provide a much more complete picture of how debt dynamics affect fiscal space.

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