Journal of International Trade, Commerce, and Economics
ISSN 3065-1417
Volume 13 Issue 2
April-June 2025
Impact Factor: 9.03
Enquiry: contact@continentalpub.online
Published by Continental Publication | https://continentalpub.online/index.php/jitce

ECONOMIC FORCES BEHIND PUBLIC DEBT ACCUMULATION IN THE GAMBIA: EMPIRICAL INSIGHTS FROM ARDL BOUNDS TESTING

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Abstract: *The accumulation of public debt, a pervasive global phenomenon, has spurred intense debate in academic and policy circles, particularly regarding its determinants in developing countries. While some scholars attribute public debt accumulation to internal factors such as poor debt management and low government revenues, others emphasize economic factors including interest rates, economic growth, inflation, debt stock, budget deficits, public expenditure, openness, and monetary policy credibility. Additionally, socio-political factors such as political systems, corruption, electoral openness, competitiveness for legislative elections, and fraud have been identified as significant determinants of public debt accumulation, particularly in countries within the Central African Economic and Monetary Community (CEMAC) region. This paper critically examines the multifaceted determinants of public debt accumulation, drawing insights from diverse scholarly perspectives and empirical evidence. By synthesizing existing literature and empirical findings, it offers a comprehensive understanding of the complex interplay between economic, political, and institutional factors shaping public debt dynamics in developing countries. The insights generated can inform policy formulation and decision-making aimed at promoting fiscal sustainability and effective debt management strategies.*

Keywords: *Public debt, Debt accumulation, Developing countries, Economic factors, Socio-political factors*

INTRODUCTION AND LITERATURE REVIEW

Public debt, which is also referred to as government debt, pertains to the total amount of money that a government owes to its creditors. However, although the accumulation of public debt is a global phenomenon, with many countries having high levels of public debt, the debate in both the academic and policy-making circles on the determinants of public debt accumulation, particularly in developing countries remains both on-going and intense. Some, including Berensmann (2019) cite internal factors, including poor debt management and low government revenues, while others found other economic factors such as interest rate, economic growth, inflation, debt stock, budget deficit, public expenditure, openness, and monetary policy credibility as determinants of public debt (Drazen, 2000; Imbeau and Pétry, 2004; Swaray, 2005 as cited in

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DOI: https://doi.org/10.5281/zenodo.15856429
Ekouala (2022:12-13). For Ekouala (2022), socio-political factors such as the system (both presidential and legislative), corruption, electoral openness and competitiveness for legislative election as well as fraud have all been found to be key determinants of public debt accumulation, particularly in countries of the Central African Economic and Monetary Community region.

Similarly, research focusing on topics such as the sustainability and the optimality of the public debt levels, as well as the corresponding sustainable trajectory of fiscal balance has also been voluminous and growing (See for example Forslund et al., 2011; IMF, 2019; Calderón and Zeufack, 2020).

Other studies have also earlier examined the elements that determine the evolution of public debt (Reinhart and Rogoff, 2010; Sinha et al., 2011; Swamy, 2015; Lau and Lee (2016). Swamy (2015) in particular revealed that economic growth, population, FDI, and inflation all had a diminishing impact on debt using the Panel Granger causality methodology. He argued that investment, government spending, and openness to trade, on the other hand, had an increasing impact on public debt. Sinha et al. (2011) used panel regression to confirm that growth in GDP, interest rate changes; inflation rate, current account, and foreign direct investment are the primary factors that influence the magnitude of public debt. However, Reinhart and Rogoff (2010) examined GDP growth and public debt nexus, concluding that if the percentage of debt-to-GDP is less than 90%, the link between them becomes weak.

Sinha et al. (2011) used panel regression to confirm that growth in GDP, interest rate changes; inflation rate, current account, and foreign direct investment are the primary factors that influence the magnitude of public debt. However, these findings were refuted by the study of Reinhart and Rogoff (2010) who examined GDP growth and public debt nexus concluding that if the percentage of debt-to-GDP is less than 90%, the link between them becomes weak. These conclusions spurred a lot of debate that led a distinct body of research to explore whether the arguments are robust enough to account for non-arbitrary debt levels (Krugman and Eggertsson, 2011; Cecchetti et al., 2011; Bittencourt, 2015).

In a study that used multiple econometric methodologies, Lau and Lee (2016) explored main factors driving public debt in The Philippines and Thailand. Their findings suggest inflation and interest cost to have been the most important elements in determining Thailand's external debt. However, no proof of relationship could be established between the aforementioned variables and public debt in the case of The Philippines. This finding conforms to an early study by Rangarajan and Srivastava (2003) who established that primary deficits and the difference between interest rates and growth significantly influences the change in debt-to-GDP ratios.

A parallel strand of literature focuses on debt sustainability and a country's debt carrying capacity is said to be determined by numerous factors, including primary deficits, interest payments, exchange rate, inflation, and GDP growth, as well as the macroeconomic environment and debt management capacities (Mahmood et al., 2009; Greenidge et al., 2010; Wyplosz, 2011; Kiptoo, 2012).

Greenidge et al. (2010) conducted a study on the drivers of foreign debt in the Caribbean countries and the results show that there is decreasing impact export and effective exchange rate (REER) on external debt. This finding conforms with the conclusion of a study by Kiptoo (2012), who looked at the factors that influence Kenya's external debt sustainability and found that the country's level of export and economic growth were both directly related to debt sustainability.

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DOI: https://doi.org/10.5281/zenodo.15856429

In groundbreaking study, Eisl (2017) evaluated the impact of government effectiveness on public debt. The results from this study showed that political stability, the rule of law, the control of corruption, government effectiveness, and regulatory quality promote lower public debt accumulation because these minimizes the incentives for governments to "borrow from the future," by increasing state capacity to collect taxes and effectively use public funds, and by providing more security and equity to private investment, inducing higher economic growth and tax revenues.

Other studies that focused on examining the nexus between public debt and these governance indicators include North (1991), Acemoglu et al. (2002), Acemoglu et al. (2005), Oatley (2010) and Gunduz (2017).

According to Gunduz (2017), institutions that control government operations in managing economic resources play a significant role in designing well-formulated policies that boost economic efficiency and lower the risk of negative shocks. In this sense, governments that have better and higher-quality institutions are more likely to stimulate performance and increase production, resulting in more job opportunities for their citizens. This according to Gunduz (2017) will convince consumers to spend more, thus enabling the government to mobilize more revenue through taxes and thereby help avoiding budget deficit in the future.

In a seminal study, Acemoglu et al. (2002) provided outstanding arguments as to why the quality of institutions is the drivers that explain the differences in economic performance between countries. These differences in the quality of institutions, according to Acemoglu et al. (2002), helps explain why some countries are wealthy, while others are impoverished, with countries having strong institutions growing faster than those without. South and North Korea, for example, were the same country in 1944, with the same people, cultures, history, languages, and geography. However, when they split in 1945, each adopted a different economic path. North Korea adopted a centrally planned economy with no private property rights, no free press. South Korea, on the other hand, adopted a capitalist system of economy that includes property rights, democracy, an open economy, and a reliable legal system. Their institutional differences reflect their divergent economic paths and, as a result, debt bearing capacity.

Strong institutions are believed to uphold and ensure effective ownership rights, which encourage investors to spend, develop, and participate in economic activities. Expectations are important in an economy and as such, if individuals believe their property rights will be retained and safeguarded, they will become more ready to invest in the country, all of which play a role in a country's debt carrying capacity and long-term debt sustainability (Acemoglu et al., 2005).

As can be seen from the foregoing brief survey of the recent literature, both theoretical and empirical findings on the determinants of public debt remain inconclusive, particularly in the context of developing countries. Hence, it is important to investigate the key determinants of public debt in the context of a small developing economy like the Gambia, given that the value of the country's public debt has risen sharply in recent years and as of September 2022, it stood at D90.7 billion (https://www.voicegambia.com/2022/12/05/gambias-debtstood-at-d90-7billion-finance-minister/). This represents a significant burden on the country's economy and poses risks to its financial stability and long-term growth prospects. Therefore, it is important to understand the factors that contribute to the country's public debt and assess their significance in shaping its trajectory.

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Overall, the literature suggests that the determinants of public debt vary across countries and regions. In the case of The Gambia, no specific studies have however identified the different determinants of the country's public debt levels.

The paper thus attempts to fill this apparent gap in the literature by addressing the main research questions of the study: do the selected variables such as trade openness, gross fixed capital formation, GDP growth, official exchange rate, and the government effectiveness manifest a causal relationship on the evolution of public debt in The Gambia, and if such a nexus exists, what are the policy implications of this link?

The paper addresses these questions by using an Autoregressive Redistributed Lag (ARDL) bound cointegration technique to analyze the determinants of public debt in the Gambia. The ARDL model is a popular econometric technique that allows for the estimation of both long-run and short-run relationships between variables, making it well-suited for analyzing the determinants of public debt.

Through this analysis, the paper makes a significant contribution to the growing body of literature on public debt in developing countries, and provides insights into the factors that contribute to the high levels of public debt, particularly in the Gambia. By analyzing the role of economic and political factors in shaping the country's debt dynamics, the paper provides a more comprehensive understanding of the determinants of the Gambia's public debt and offers practical recommendations for improving debt management, not only in the Gambia, but in other developing and emerging economies, as well.

The rest of the paper is structured as follows. Section II describes the research methodology used in the study, including a description of the data, variables, and econometric techniques. Section III provides an analysis of The Gambia's public debt portfolio in order to give the discussion more meaning.

Section IV presents the empirical results of the ARDL model, including a discussion of the significance of the determinants of public debt in the Gambia, while Section V concludes the study by summarizing the main findings of the paper, highlighting its contribution to the literature, and provides recommendations for the country's policymakers and other stakeholders.

DATA AND METHODOLOGY

The study is based on secondary time series data and focuses on both short-run and long-run analysis to check the determinants of public debt in the Gambia.

Data

This study uses a time series data on DEBT (public debt to GDP ratio), GROWTH (GDP growth), OPEN (trade openness), GFCF (gross fixed capital formation as a percentage of GDP), RIR (real interest rate), EX_RATE (official exchange rate), and GOV_EFF (Government Effectiveness) all extending over the period from 2000 to 2019. The data was extracted from the World Development Indicators (WDI) database, and from the Central Bank of the Gambia (CBG) data warehouse.

Similar variables have also been used in previous studies on the determinants of public debt (Ekouala, 2022; Bittencourt, 2015).

To determine the influence of economic growth on public debt, the model includes GDP growth (GROWTH) over the period of the study. Higher economic growth raises domestically generated

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revenue, which reduces the need for debt. Hence, the expected sign of the GROWTH coefficient in this paper is negative.

Trade Openness in this paper measures the degree to which a country is engaged in trade with the rest of the world. It is determined as the summation of exports plus imports in a year divided by Gross Domestic Product (GDP). Despite the fact that openness of an economy does manifest a direct link with public debt, they are widely established to have manifested an inverse relationship. Least developed economies are typically characterized by restrictions on trade.

According to Auboin and Meier-Ewert (2003), the elimination of trade barriers can lead to greater growth in an economy and an increase in export, thus, reducing dependence on external debt. The expected sign of openness in this paper is negative, implying that the more the open an economy is, the lower its public debt levels.

Exchange rate fluctuations have been widely argued in most of the literatures to have impacted the debt levels in many least developed countries. When the value of a country's currency appreciates its debt level reduces, vice versa. The study expects to manifest a positive relationship between EX_RATE (official exchange rate and public) and DEBT (public debt as percentage of GDP). A control variable, Gross Fixed Capital Formation (GFCF) is expected to have a positive coefficient as the more investments are undertaken by the Government; the more they borrow more from the external sources to finance these investment projects thus increasing public debt levels.

Another potential influencing element on public debt levels which has been generally overlooked is government efficacy. Only Asiedu and Lien (2011) evaluate, at least implicitly, the impact of government effectiveness on public debt.

Taking example on FDI inflow, findings have established too much of unnecessary levels of bureaucracy in a government obstruct such flows.

We may infer this finding to the postulated causal relationship that link governance indicators to the government debt levels. Government effectiveness has both restricting and enabling impact on both public and private players.

Firstly, effective governments have viable, cogent, and result oriented policies that allow them to better and prudently allocate its meagre funds. This helps in reducing the dependence on the issuance of new debt to support the government's budget.

Secondly, because an effective government delivers a steady and relatively beneficial economic environment, the quality of public services helps increase the amount of revenue generated in an economy. As a result, higher tax revenues are generated, reducing budget deficit, which necessitates borrowing.

Government effectiveness variable in this paper is part of the World Governance Indicators from the World Bank database that are calculated from 31 diverse sources which are based on hundreds of different factors (Kaufmann et al., 2010). The data exclusively focuses on perception data reported by commercial information providers, public sector organizations worldwide, survey respondents, and NGOs. The aggregate indicator of a country's score is expressed in standard normal distribution units (-2.5 to 2.5).

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The explanatory variables described above were selected based on the review of the empirical and theoretical literature on the determinants of public debt.

Model specification

As argued by Njie and Badjie (2021), the preferable model for the assessment of the determinants of public debt is the vector error correction model (VECM) because the time series vary and are not stationary at the level term. However, the data are mostly stationary.

Vector Error Correction (VEC) model

A Vector Error Correction Model (VEC) as in (1) is a restricted VAR designed for use with non-stationary series that are known to be integrated. The VEC has cointegration relations built into the specification so that it restricts the long run behavior of the endogenous variables to converge to their cointegration relationships while allowing for short run adjustment dynamics.

This study uses a time series data on DEBT (public debt to GDP ratio), GROWTH (GDP growth), OPEN (trade openness), GFCF (gross fixed capital formation as a percentage of GDP), RIR (real interest rate), EX_RATE (official exchange rate), and GOV_EFF (Government Effectiveness). The analysis of the determinants of public debt in the Gambia is based on the following model:

$$\mathrm{DEBT}_t^j = \hat{\beta}\, X_t^j + \mu_j + \vartheta_j + \varepsilon_{jt} \quad (1)$$

X_t^j is a vector of regressors including lagged GDP growth (GROWTH), openness (OPEN), Gross fixed capital formation (GFCF), real interest rate (RIR), official exchange rate (EX_RATE), government effectiveness (GOV_EFF). The dependent variable in the analysis below is the public debt to GDP rate. It also includes the constant. μ_j is country-specific fixed effects, ϑ_j is time fixed effects, ε_{jt} is the unobservable error term. The final equation estimated in the model is given as:

$$DEBT_t^j = GROWTH_{t-1}^j + OPEN_t^j + GFCF_t^j + RIR_t^j + EX\_RATE_t^j + GOV\_EFF_t^j + \mu_j + \vartheta_j + \varepsilon_{jt} \quad (2)$$

Table 1 provide the description of variables and data sources.

Descriptive statistics

Analysis of the Gambia's public debt portfolio

In this part of the study, a brief description of the nature and pattern of growth of the Gambia's public debt portfolio was provided.

One of the most worrying and challenging economic issues faced by the policy makers in The Gambia is the high risk of debt distress on the public debt portfolio. From the recent debt sustainability analysis conducted, the results have shown that the country has breached most of the indicative debt sustainability thresholds by substantial margins, signaling major liquidity pressures (MoFEA, 2020a). Since the country received debt forgiveness through the Highly Indebted Poor Countries (HIPC) initiatives, the debt levels have been rapidly increasing; this continues to pose threatening macroeconomic implications. According to an IMF (2018) Second Staff Monitoring Program Review, The Gambia's public debt risks have worsened, with the ratio of debt to GDP approximately 130% at end 2017. Debt service to revenue threshold registered significant breach in the recent periods showing a liquidity challenge of the government as huge chunk of the domestically generated revenue predominantly from taxes goes into servicing debt consequently restraining government spending in other pressing sectors like agriculture, education, health etc.

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This situation propelled the government to reduce the cost-risk factors embedded in the public debt portfolio over the medium to long term by pursuing various policies aimed at addressing these problems such as seeking only concessional external financing and lengthening the maturity profile of the domestic debt to reduce rollover risk. One of the major objectives of these policies was to reduce the government's net domestic borrowing, which would relieve yield pressure and allow for a progressive extension of the maturity profile thus, help avoid locking in excessive costs upfront by extending the maturity too quickly (MoFEA, 2020 b).

The Gambia's public debt can be traced back to the 1970s when the country began borrowing from external sources to finance its development projects. By the 1980s, The Gambia's public debt had already reached alarming levels, and the government had to resort to borrowing from the International Monetary Fund (IMF) to meet its debt obligations.

In the 1990s, The Gambia's public debt continued to increase, mainly due to external borrowing to finance infrastructure projects. By 2000, the country's public debt had reached $539 million, representing about 93% of GDP. This high level of debt led to a debt crisis in The Gambia, which prompted the government to seek debt relief from international creditors.

In 2007, The Gambia's external debt was reduced by 87% under the Highly Indebted Poor Countries (HIPC) initiative, which was a to reduce the Gambia's debt-to-GDP ratio to 45% in 2010.

Despite the debt relief, The Gambia's public debt continued to rise in the following years, mainly due to domestic borrowing to finance recurrent expenditure. By 2017, the country's public debt had reached $1.2 billion, representing about 120% of GDP. This high level of debt has put a strain on the country's economy and has made it difficult for the government to finance its development projects.

In recent years, the government of The Gambia has taken steps to address the issue of public debt. In 2018, the government launched a debt sustainability analysis to assess the country's debt position and develop a strategy for managing its debt (International Monetary Fund, 2018). The analysis found that The Gambia's debt was sustainable in the medium term, but it was still vulnerable to external shocks.

Notwithstanding, no specific research has examined the drivers of Gambia's debt levels to the best of my knowledge. As a result, this research intends to add to the current body of knowledge on the relationship between specified variables and public debt levels with focus on The Gambia. The Government, particularly the Ministry of Finance and Economic Affairs will be interested in this paper's findings which can be used to make policy decisions.

To achieve this goal, this paper will attempt to address the following central research question: What are the key determinants of public debt accumulation in the Gambia?

In finding answer (s) to the aforementioned question, the paper uses the Autoregressive Distributive Lags Mechanism (ARDL) as proposed by Pesaran et al. (2001) to test whether the selected variables manifest a short run or long run impact on the public debt levels in The Gambia.

Table 1. Descriptive statistics.

Variable	N	Mean	Std. Dev.	Min	Max
DEBT	20	101.22	31.48	60.91	156.01
GROWTH	20	3.18	4.22	-8.13	7.23
OPEN	20	0.51	0.08	0.39	0.69
GFCF	20	15.18	5.45	4.56	24.92
RIR	20	19.21	12.12	-29.71	29.59
EX_RATE	20	31.76	10.69	12.79	50.06
GOV'T_EFF	20	-0.64	0.11	-0.90	-0.47

Source: Authors.

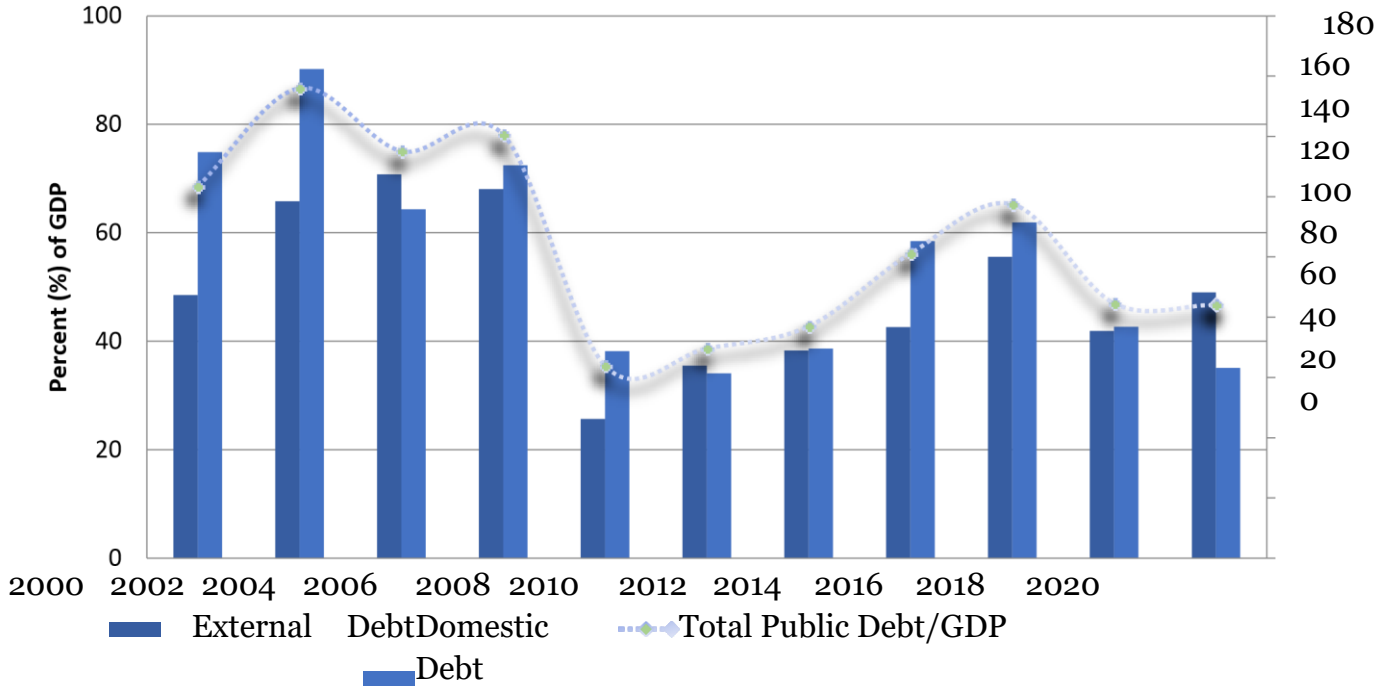


Figure 1. Evolution of public debt outstanding as a percentage of GDP. Source: Authors.

joint program between the IMF and the World Bank aimed at reducing the debt burden of the world's poorest countries. This debt relief helped

Public debt evolution in the Gambia

The graph in Figure 1 illustrates the historical trend in the evolution of public and publicly guaranteed debt for the past twenty years. The Gambia's public debt levels have ever been in an increase before the receipt of the HIPC and MDRI debt reliefs mainly as a result of persistent budget deficits, fiscal slippages, and an increase in guarantees to the State Own Enterprises (SOEs). Before the receipt of the HIPC debt relief, the county's debt levels reached 140 per cent to GDP.

In 2007 the country reached the HIPC completion point and benefited from assistance worth 66.6 million USD which was meant to reduce the country's debt as a percentage of export below the 150 per cent HIPC threshold. In terms of net present value, World Bank and IMF contributions to this debt

relief were US$22.3 million and US$2.3 million, respectively. As of November 2007, US$8.0 million and US$0.6 million of these total promises had already been delivered as interim assistance. In Net Present Value (NPV) terms, the total debt relief provided between 2001 and 2007 was US$17.5 million. In addition, The Gambia also benefitted from Multilateral Debt Relief Initiative (MDRI) that was initiated by the G8 countries to eliminate debts of most indebted countries with the aim to further reduce HIPCs debt and offer more resources to assist in achieving the Millennium Development Goals. This relief has helped to reduce the Debt to GDP ratio down from 140.5% to 60.9% as shown in Figure 1.

Even though the relief was on the external debt portfolio, the impact of the relief has trickled down on the domestic debt portfolio too as the relief has created a breathing space for the budget which eventually reduced the issuance of T-bills from the domestic debt market to finance the budget deficit. Despite the receipt of these debt reliefs, the country soon started to breached most of the indicative debt thresholds in less than a decade which can be attributed to the uncontrollable growth in the budget deficit. This has forced the government to restructure its external debt with most of the bilateral and multilateral creditors in 2020 by deferring principal payments up to 2024.

According to the Debt Sustainability Analysis (DSA) report (2020), exchange rate, economic growth, primary balance, nominal interest rates, and foreign direct investments, as well as current account balance have been the driving factors on the growth of public debt in The Gambia. Historical data have shown that the combination of current account deficit and FDI are established to have been the most significant cause of the increase in debt in The Gambia. Other inexplicable factors (residuals) could have contributed to debt accumulation in the past, some of which will be assessed in this paper.

Table 2. Unit root test.

	Dickey-Fuller Unit-Root-Test (DFURT) using AIC		
Variables	**P-value at level**	**P-value at 1st difference**	**Judgment**
DEBT	-1.624	-4.782***	1(1)
GROWTH	-4.680***	-	1(0)
OPEN	-2.536	-5.194***	1(1)
GFCF	-1.988	-6.566***	1(1)
RIR	-4.179***	-	1(0)
EXC	-0.700	-2.784*	1(1)
GOV_EFF	-2.955**	-	1(0)

*, **, and *** represent 10, 5 and 1% significance levels, respectively.
Source: Authors.

EMPIRICAL RESULTS AND DISCUSSION

The major objective of this paper is to examine the determinants of public debt in the Gambia. Therefore, in this section, we will discuss the results from the ARDL model used to estimate determinants of the country's public debt by presenting and discussing the results of the Dickey-Fuller Unit-Root-Test, the lags selection using AIC, the ARDL bound test and the stability check that was used to test the long run stability and reliability of the ARDL model.

Dickey-fuller unit-root-test

Unlike most of the other co-integration techniques, the ARDL has important properties that make it appropriate for this study. For example, it does not impose a limiting condition that all variables for the research must be integrated using the same order. Furthermore, the ARDL methodology produces precise estimates even if the sample size is small, but other co-integration methods are sensitive to sample size, so doing bounds testing will indeed be consistent with this study. Read Srinivasan et al. (2012) for additional information on the ARDL approach.

Pesaran et al. (2001) suggested the ARDL technique that is premised upon its estimation of an Unrestricted Error Correction Model (UECM), which has significant advantages over traditional cointegration methods.

Moreover, all the variables in this paper are time-series data, which means they could be non-stationary having unit roots. A simple regression model using nonstationary variables might generate erroneous results.

ARDL model is deemed ineffective when series are integrated to order 1(2) or above. As a result, I first run a unit root test on the time-series variables. The test results are shown in Table 2, which indicates that variables are integrated to a series of 1(1) or 1(0), indicating that the ARDL model is suitable to use.

Lags selection using AIC

Unrestricted ECM was used in order to check the long run co-integration of the variables in the model. To be able to do that, the number of lags must be established first before executing UECM which I did using the Akaike Info Criteria (AIC).

The lag lengths (1 0 1 1 0 1 0) established in Table 3 using the AIC are included in the Error Correction Model in order to establish the short run impact of the independent variables on public debt.

Table 3. AIC lag lengths.

LAG	Variable						
level	DEBT	GROWTH	OPEN	GFCF	RIR	EX_RATE	GOV_EFF
0	9.47249		6.69022	5.89173		7.31769	
1		5.91796			8.21932		-1.71521
2	9.13928	5.90838	6.68267	5.43455	8.34429	4.83351	-1.64514
3	9.24051	6.0286	6.73295	5.50353	8.46097	4.88081	-1.5246
4	9.27908	6.04665	6.72456	5.62239	8.57502	5.00578	-1.4259

Source: Authors.

Table 4. ARDL bounds test result.

H_0: no levels relationship		F = 11.475						
		t= -6.356						
Critical Values (0.1 -0.01), F-Statistic, Case 3								[I_1] L_01
	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	4.26
K_7	2.03	3.13	2.32	3.5	2.6	3.84	2.96	
Accept if F < critical value for I(0) regressors Reject if F > critical value for I(1) regressors								

Source: Authors.

ARDL bound test

The ARDL bound test is used to check the co-integration and long-run connection between DEBT, GROWTH, GFCF, OPEN, RIR, EX_RATE, and GOV_EFF. The empirical findings of the ARDL bound test are presented in Table 4. The results show that the F - value is higher than the upper bound value, indicating that there is a long-run relationship and co-integration between public and the explanatory variables.

Stability check

The CUSUM SQUARE was used to test the long run stability and reliability of the ARDL model as proposed by Brown et al. (1975). As seen in Figure 2, the CUSUM of SQUARES test falls within the significant threshold of 5% range. This indicates that all of the parameters utilized in the ARDL regression analysis have remained steady throughout time. **Long Run ARDL model using AIC criteria**

According to the output of the estimated long run ARDL (1, 1, 1, 0, 0, 0, 0, 1) shown in Table 5, trade openness, investment, GDP growth, government effectiveness and official exchange rate are the main determinants of the Gambia's public debt in the long run with some degree of statistical significance.

The results show that trade openness and investment are positively associated with public debt accumulation in the Gambia and are significant at 1% and 10% significant levels respectively. This is in line with our theoretical preposition and findings in earlier literature. On the other hand, GDP growth, government effectiveness, and official exchange rate are inversely related the public debt in the Gambia. This is consistent with their significance levels at 5, 5, and 10% respectively.

The negative relationship between GDP growth and public debt levels manifested by the results of this paper is supported by the findings of Hall and Sargent (2010). This is in line with the assertion that higher economic growth enhances a country's domestic revenue generation, which in turn helps in

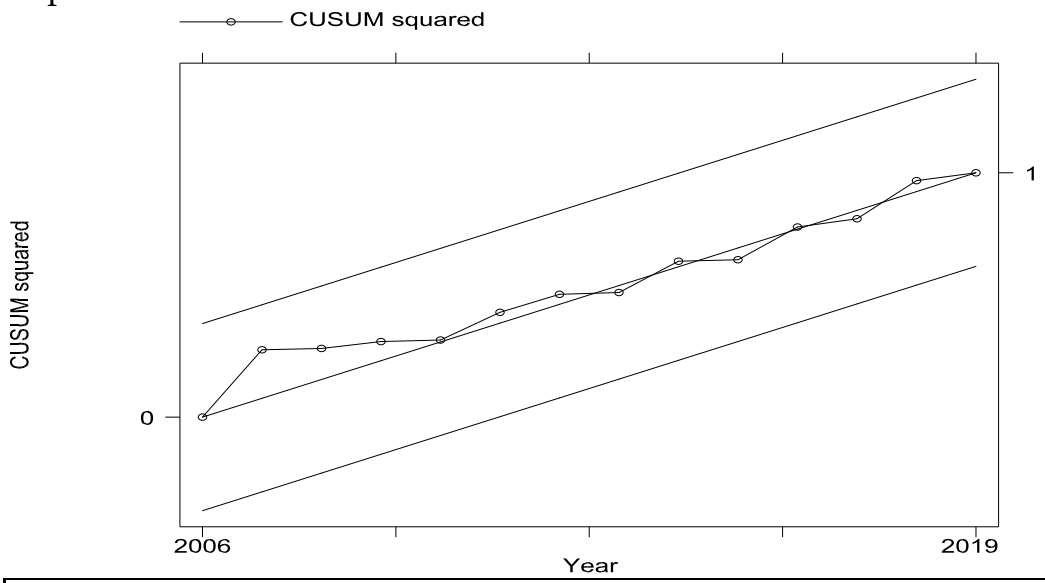
lowering a country's budget deficit thus reducing the pressure to contract loans to finance the budget deficit.

In the same vein, the decreasing effect of government effectiveness on public debt can be supported by the findings of Melecky (2012) who posits that countries with effective governments have good public debt management strategies and policies that help in mitigating financial risk and lower cost of borrowing, thus keep the debt at a sustainable level.

Gross fixed capital formation shows a significant positive relationship which is in line with most of the findings in the literature. As governments embark on more investment ventures, they tend to borrow more to finance these investment activities.

In the short run, the model shows that none of the selected variables affect public debt in The Gambia as they are all statistically insignificant.

The Error Correction Model (ECM) measures the rate of adjustment back to equilibrium in an ARDL model. If the adjustment speed or error correction term is inside the (0, -1) boundary; it shows that there is a long-term convergence of the model. However, if the adjustment speed does not lie within the (0, -1) boundary, then projected debt accumulation will be regarded to be growing out of hand. Therefore, the above results show that the evolution of Gambia debt level will not aggressively grow in the long run. This is supported by the ECM coefficient (-0.898) which is statically significant at 5% significant level. The estimate, -0.898, implies that 89.9% of the deviation from the long-run relation is adjusted in a year, which can be interpreted as indicating that the short-run dynamics is not really important.



CUSUM of Squares 5% Significance

Figure 2. CUSUM squared. Source: Authors.

Table 5. ARDL model regression output.

ARDL (1,1,1,0,0,0,1) regression
Sample: 2000 - 2019
Number of obs = 20
R-squared = 0.7966
Adj R-squared = 0.5424
Root MSE = 15.7573
Log likelihood = -71.131157

D.DEBT	Coef.	Std. Err.	t	P>t	[95%Conf.	Interval]
ADJ						
DEBT						
L1.	-0.836**	0.238	-3.510	0.008	-1.386	-0.286
GROWTH	-3.169*	1.303	-2.432	0.041	-6.172	-0.165
OPEN	4.834**	0.942	5.131	0.001	2.661	7.006
GFCF	7.820*	3.493	2.240	0.056	-0.234	15.874
RIR	-0.528	0.523	-1.010	0.342	-1.734	0.678
EX_RATE	-5.851**	1.818	-3.220	0.012	-10.043	-1.658
GOV_EFF	-13.346*	6.301	-2.118	0.085	-29.056	23.363
SR						
OPEN						
D1.	-1.415	1.018	-1.390	0.202	-3.762	0.932
GFCF						
D1.	-1.402	1.975	-0.710	0.498	-5.958	3.153
EX_RATE						
D1.	3.869	2.205	1.750	0.117	-1.216	8.955
_cons	-124.885*	52.942	-2.360	0.046	-246.970	-2.801

*, **, and *** represent 10, 5, and 1% significance levels, respectively. Source: Authors.

Conclusion

The aim of this research is to empirically investigate the drivers of public debt levels in The Gambia, using the ARDL model.

The Gambia's efforts to attain higher and sustainable economic growth are significantly hampered by the country's huge and expanding public debt and its servicing. This paper contributes to the body of literature on the determinants of public debt with specific focus on the Gambia by using the Autoregressive Redistributive Lags (ARDL) technique. In order to achieve this aim, time series data from 2000 to 2019 was used on the selected variables that impact debt accumulation both in the short run and in the long run.

The results show that the effectiveness of a government has a decreasing effect on the public debt levels in The Gambia in the long run. This suggests that an effective government which is characterized with

quality policy formulation, implementation, and a well functional debt management office may help in keeping the public debt at a sustainable level. Similarly, the appreciation of The Gambian Dalasi is found to reduce the public debt burden, however, this might eventually be a problem as the appreciation of the currency may lead to an expansion of the current account deficit and hence the external debt. Therefore, policy makers should ensure to have a stable currency in order to mitigate the exposure of external debt to foreign exchange risk.

Trade openness and gross fixed capital formation on the other hand are both associated with an increase in the public debt levels in The Gambia. However, the result of the error correction model shows that none of these variables are significant in determining the public debt levels in the short run. This implies that the short run dynamics of the public debt may not be that significant, and thus, policy makers should pay more attention to the factors that have a long run influence on the public debt levels.

Our findings have some implications for policy-making in the Gambia because the results show that an increase in economic growth is associated with a decrease in public debt in the long run. As a result, the government should pursue programs and policies that will enhance economic growth in order to keep the debt at an optimal and sustainable level.

Finally, the Government of the Gambia, particularly the Ministry of Finance, may find the results of this study useful in making economic policy decisions such as whether to increase the country's public debt and the implications such decisions for the Gambia's long-term economic growth prospects.

CONFLICTS OF INTERESTS

The authors have not declared any conflicts of interests.

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