University of Piraeus

SPOUDAI
Journal of Economics and Business
Σπουδαί
http://spoudai.unipi.gr

Does Public Debt Impact Economic Growth in Zambia? An Ardl-Bounds Testing Approach

Talknice Saungweme[a], Nicholas M. Odhiambo[b]

[a]*University of South Africa, Economics Department, South Africa*
Email: talknice2009@gmail.com
[b]*University of South Africa, Economics Department, South Africa.*
Email: odhianm@unisa.ac.za

Abstract

This study examines the dynamic impact of public debt on economic growth in Zambia from 1970 to 2017. The study also estimated the relative impact of domestic public debt and foreign public debt on economic growth in Zambia. Using the autoregressive distributed lag (ARDL) bounds testing methodology, the results show that public debt has a positive impact on economic growth in Zambia, both in the short run and in the long run. The empirical results further reveal that the relative impact of public debt on economic growth in Zambia is dependent on the type of debt under consideration and is also time-invariant. Domestic public debt was found to be negatively related to economic growth, while its foreign counterpart had a positive impact, both in the short run and in the long run. To ensure sustainable economic growth and sustainable public debt levels, the study recommends the country to, among other things: 1) match financial resources with the country's absorptive capacity; 2) continuously and effectively manage its debt composition and structure to reduce currency and maturity risks; and 3) to continue with the implementation of structural and financial reforms in order to promote the efficient utilisation of public finance.

Keywords: Public debt, domestic public debt, foreign public debt, economic growth, Zambia, ARDL
JEL Classification: H62, H63, O47

1. Introduction

The debate regarding the impact of public debt – domestic and foreign – on economic growth has been ongoing since the beginning of organised society (Fetter, 1980: 111). Since then, the debate has attracted several empirical studies in both developing and developed countries, focusing mostly on foreign public debt while very little attention was given to the domestic public debt (see, for example, Salotti and Tcecroci, 2012; Rodrik, 2008; Clements *et al.*, 2003). Despite the vast volume of literature on these empirical studies, the impact of public debt on economic growth has generally been inconclusive, possibly due to differences in econometric methodologies, variations in datasets, and country heterogeneity factors.

The empirical evidence from most of the past studies on this topic, however, suggests that public debt has a strong negative impact on economic growth through the normal crowding-out effect (Gómez-Puig and Sosvilla-Rivero, 2018; Eberhardt and Presbitero, 2015; Panizza and Presbitero, 2013; Égert, 2012). Most of these previous empirical studies suffered from two major pitfalls. First, the studies focussed on foreign public debt, thus ignoring the impact of domestic public debt on economic growth (see Uzun *et al.,* 2012; Cordella *et al.,* 2010; Clements *et al.,* 2003). Nowadays, most developing countries are either reorganising their banking systems to fully develop domestic credit markets – predominantly secondary markets for long-term financing requirements; or innovating their financial instruments in order to rely more on domestic public debt and less on foreign debt (Dahou *et al.,* 2009). Second, numerous past empirical researches have relied exclusively on the cross-sectional methodology which fails to explicitly explain the potential biases arising from cross-country heterogeneity (see Gómez-Puig and Sosvilla-Rivero, 2018; Égert, 2015; Kourtellos *et al.,* 2013; Checherita-Westphal and Rother, 2012).

To the best of our knowledge, this study will be among the first to examine, in detail, the dynamic impact of public debt on economic growth in Zambia, as well as further examining the relative impact of domestic and foreign public debt on economic growth in the study country. This study differs from past studies in that it estimates two separate models – the aggregated public debt model, and the disaggregated public debt (domestic and foreign public debt) model – to expound on the dynamics of public debt and economic growth in Zambia. Very few studies in Southern Africa have undertaken such an exhaustive examination into these linkages. The specification allows the study to suggest country-specific policies based on the research findings. Also, unlike other past studies on this topic that have exclusively depended on conventional cointegration approaches, this study utilises the autoregressive distributed lag (ARDL) bounds testing method with its known superior properties, such as employing a single reduced form equation to give the long-run relationship (Pesaran and Shin, 1999).

The rest of the study is organised as follows: Section 2 discusses the trends on public debt and economic growth in Zambia. Section 3 reviews related literature on the public debt-economic growth link, while Section 4 discusses the methodology of the study and presents the empirical results and the analysis thereof. Section 5 concludes the study.

2. Public Debt and Economic Performance in Zambia

Since 2010, the Zambian economy was on the rise, driven profoundly by booming copper export prices, increased electricity generation, massive construction and industrialisation, and rapid growth in the services sector (Ministry of Finance/MOF, 2017). By, 2015, the average annual growth rate of gross domestic product (GDP) of Zambia was 6.9%, making it the fastest growing economy in sub-Saharan Africa (SSA) (World Bank, 2016a). However, a mixture of weak performance in mining, construction and service sectors and lower levels of public investment between 2015 and 2017 lowered the annual GDP growth rate in 2017 to 3.8% (Central Statistical Office/CSO, 2017; Smith *et al.,* 2016). Subsequently, the state revenue underperformed, with emergence of large primary deficit reaching 12% and 8.8% of GDP in 2015 and 2016, respectively (MOF, 2017).

During the period from 1970 to 2006, the Zambian government had finite borrowing alternatives, limited to organisations such as the World Bank, the IMF and the African Development Bank (International Bank for Reconstruction and Development, 2017). However, from 2007, the country had diverse sources of borrowing, including access to

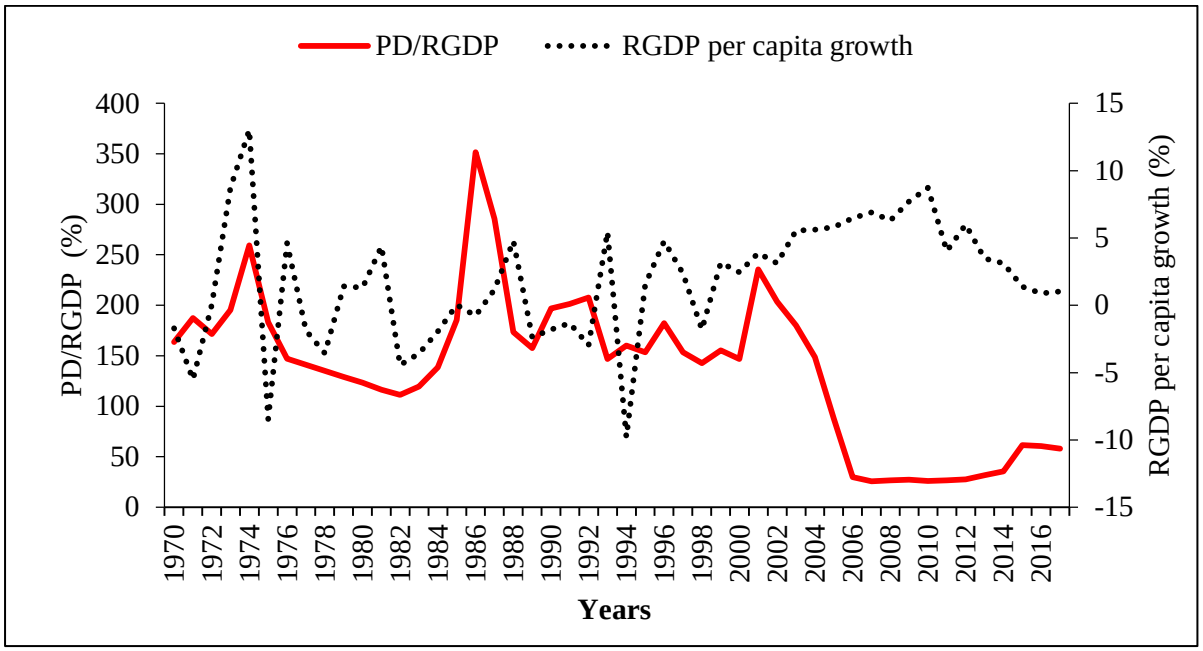
global financial markets. As a result, the foreign public debt developments in Zambia have been rapid after 2006, and the country is, according to the International Monetary Fund (IMF) (2017a), at a high risk of debt distress.

The growth in public debt during the period under review, 1970 to 2017, has been a result of the compounding effect of both domestic and foreign public debt. Growth in domestic public debt in Zambia has been largely driven by the following factors: (1) rising domestic interest rates in the 1980s and 1990s; (2) accumulation of domestic debt arrears, pension arrears and other forms of compensations payment obligations in the 1980s; (3) budget allocation overruns by the central government; (4) introduction of new government securities; (5) increased issuance of government securities; and (6) increased contingency liabilities from state-owned enterprises (Bank of Zambia, 2017a; World Bank, 2017a; World Bank, 2016b; African Forum and Network on Debt and Development, 2011). For instance, the Bank of Zambia issues treasury bonds every two months as part of government efforts to deepen the country's capital markets; and treasury bills every fortnight following improved domestic liquidity (Bank of Zambia, 2017a).

The demand for the government securities comes largely from the banking sector, state pension funds and insurance companies (Bank of Zambia, 2017a; Government of the Republic of Zambia "GRZ", 2007). Bridging loans have also been a major source of short-term debt for the Zambian government, reaching 4% of GDP in 2016 (Bank of Zambia, 2017a). Furthermore, the debt by parastatals is explicitly guaranteed by the government of Zambia, accounting for 2.3% of GDP in September 2017 (IMF, 2017a). A combination of these aforementioned developments in the domestic capital market has culminated in growing stock of domestic public debt in Zambia.

Figure 1 presents the trends in public debt and economic growth in Zambia between 1970 and 2017. Public debt (PD) is expressed as a ratio of real GDP, while economic growth is measured by the annual growth rate of real GDP per capita.

Figure 1: Trends in Public Debt and Economic Growth in Zambia (1970-2017)



Source: World Bank (2017b)

The trends portrayed in Figure 1 indicate that Zambia's economic growth was not stable between 1970 and 1998, reaching a period low of -9.8% in 1994 (World Bank, 2017b). However, there was an economic rebound from 2000 until 2014 in which annual economic growth averaged 4.6%, with a period peak of 8.7% in 2010 (World Bank, 2017b). The steady increase in annual growth rate of real GDP per capita during this period – 2000 to 2014 – can be attributed to increased copper output, high copper prices, increased power supply and a boost in agricultural exports (International Bank for Reconstruction and Development, 2017). As Figure 1 depicts, the economic growth rate eased in 2015, 2016 and 2017, recording 1.4%, 0.9% and 1.0%, respectively (MOF, 2017). The economic slowdown followed poor achievements in the services, extractive and construction industries beginning the end of 2015 (World Bank, 2016b).

With respect to public debt dynamics in Zambia, Figure 1 shows that there are three episodes: (1) 1970 to 2005, in which government debt exceeded national output; (2) 2006 to 2014, in which public debt levels were below 40% of GDP; and (3) 2015 to 2017, in which public debt levels exceeded the World Bank and IMF debt sustainability threshold of 40% of GDP, averaging 59.9% (IMF, 2017a; World Bank, 2017b).

The rise in domestic public debt has also been associated with an exponential increase in foreign public debt since 2006. Zambia had been borrowing extensively since the 1970s, but the debt relief initiatives extended to it by the international creditor community beginning early-1990s substantially reduced the country's foreign public debt from 148% of GDP in 2004 to 29% in 2006 (World Bank, 2017b). The period stretching from 1970 to 2000 was characterised by persistent current account deficits such that the central government relied almost entirely on borrowing from global financial institutions and capital markets to finance the fiscal gap – hence this period is sometimes referred to as a "foreign debt-led" period (African Forum and Network on Debt and Development, 2011; GRZ, 2006).

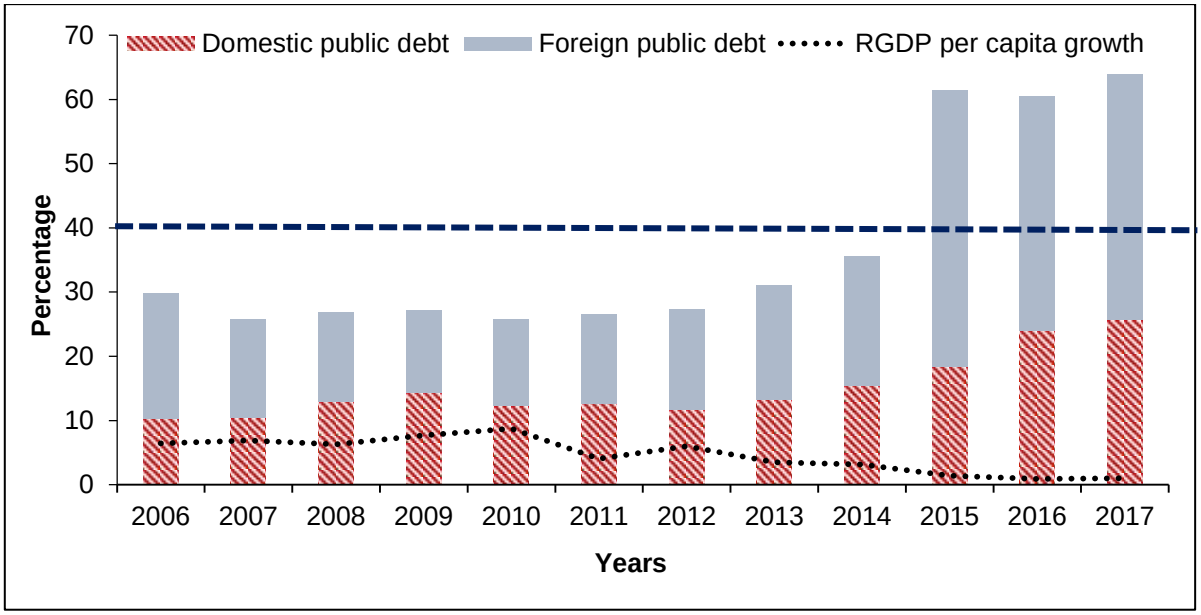
Further, the swift accumulation in foreign indebtedness after 2006 is likely to have been caused by a mixture of factors, such as new non-concessionary borrowing from international capital markets, the issuance of Eurobonds and syndicated loans on international debt markets, and significant real exchange rate depreciations (International Bank for Reconstruction and Development, 2017). Zambia, like many other African countries, has been borrowing on a non-concessionary basis from various international creditors, such as China and other emerging market economies, to reduce its fiscal imbalances (IMF, 2017a). Also, Zambia has issued Eurobonds three times since 2012 – in 2012, 2014 and 2015 – with the cumulative value amounting to US$3 billion in 2016 (IMF, 2017a). The country has also raised US$450 million in 2016 through a syndicated loan (International Bank for Reconstruction and Development, 2017). Subsequently, foreign public debt grew from US$1.9 billion (or 8.4% of GDP) in 2011 to US$8.0 billion in 2016 (or 36.5 % of GDP) (MOF, 2017).

Conclusively, the dynamics of public debt during the period under review are reflected in the rapid changes in both domestic and foreign public debt components, especially after the debt relief initiatives. Figure 2 presents the public sector debt structure of Zambia, expressed as percentage of real GDP, in the period after the debt relief initiatives.

Figure 2 shows the trends in domestic and foreign public debt in Zambia between 2006 and 2017. Although both components of public debt have been growing since 2006, the rate accelerated after 2015. From 2015 to 2017, an assortment of poor performances in key economic sectors, such as copper mining and agriculture widened the primary deficits and exacerbated both domestic and foreign public borrowing (CSO, 2017; IMF, 2017a). Accordingly, Figure 2 portrays two distinct phases, 2006 to 2014, and 2015 to 2017. In the

former phase, public debt levels were sustainable according to the IMF/World Bank sustainability threshold, while in the latter phase, sovereign debt is seen to be unsustainably high placing the country at an excessive risk of debt trouble.

Figure 2: Public Sector Debt Structure in Zambia (2006-2017)



Source: Bank of Zambia (2017b)

While foreign public debt was driven up by both new external borrowing and exchange rate depreciation, the domestic counterpart was driven by the intensified issuance of state securities and central bank riding loans (Smith *et al.*, 2016). The proportion of domestic public debt to GDP rose from 12.7% in 2011 to 25.6% in 2017 (IMF, 2017a). The rise in domestic debt after 2011 was typically from rising issuance of treasury bills, treasury bonds and accumulation of arrears and financing from the banking system (IMF, 2017a).

On the economic growth front, Figure 2 shows that from 2006 to 2010, the Zambian economy was generally stable, and that it grew by an annual average rate of 5.8% (World Bank, 2017b). The economic growth rates, however, gradually eased from the peak of 8.7% recorded in 2010 to a period low of 0.9% recorded in 2016 (World Bank, 2017b). The positive economic growth rates reported between 2006 and 2014 were largely a result of increased copper production, high global copper prices and a major boost in agricultural exports; while the economic slowdown between 2015 and 2017 was mostly the cumulative effect of poor achievements in the services, extractive and construction industries (GRZ, 2015).

3. Public Debt and Economic Growth: A Review of Literature

Although the relationship between public debt and economic growth has been scrutinised vastly in the literature, the outcomes have been inconclusive. Until now, there are four perspectives in the literature about the correlation between public debt and economic growth.

The first view argues that there is a strong negative association between public debt and economic growth caused by debt overhang (Myers, 1971), crowding-out effect (Krugman,

1988; Diamond, 1965; Modigliani, 1961) and fiscal illusion (Patinkin, 1965). This argument has been widely supported empirically by Huang *et al.* (2018), Gómez-Puig and Sosvilla-Rivero (2018), Soydan and Bedir (2015), Ewaida (2017); Broner *et al*. (2014), Lof and Malinen, 2014); Reinhart *et al.* (2012) and Cochrane (2011), among others.

The second view states that sovereign debt positively influences economic growth and is supported in literature by the dual gap theory (Chenery and Strout, 1966; McKinnon, 1964), the Wagner's hypothesis of "Law of increasing state activity" (Kobayashi, 2015; Wagner, 1893) and the Keynesians' fiscal multiplier effect (Rebelo, 1995; Arrow and Kuz, 1970). Empirically, this premise is backed by studies such as Balcilar (2012), Greiner (2011), Abu-Bakar and Hassan (2008), and Abbas and Christensen (2007).

The third view states that the link between public debt and economic growth exhibits a nonlinear form (see Sachs, 1989; Krugman, 1988). The empirical work which is linked to this hypothesis comprises Dogan and Bilgili (2014), Baum *et al.* (2012), Minea and Parent (2012), Cecchetti *et al.* (2011), Checherita-Westphal and Rother (2010), and Reinhart and Rogoff (2010a, 2010b). Finally, there is the view that public debt and economic growth have a neutral relationship (see Barro, 1974; Buchanan, 1976). The empirical studies which are associated with this supposition comprises Kourtellos *et al.* (2013) and Schclarek (2004).

The effect of sovereign debt on economic growth is the joint impact of both foreign and domestic debt. Pertaining to the link between foreign public debt and economic growth, considerable empirical work has been done in developing countries (See Zaman *et al.*, 2013; Clements *et al.*, 2003; Nguyen *et al.*, 2003; Pattillo *et al.*, 2002, among others). The bulk of these empirical studies support the view that high foreign public debt levels act as an impediment to capital accumulation in the domestic economy and lead to capital flight (See Salotti and Tcecroci, 2012; Rodrik, 2008; Clements *et al.*, 2003; Moss and Chiang, 2003; Nguyen *et al.*, 2003). Furthermore, Borenzenstein *et al.* (2004) assert that foreign public debt leads to future public policy scepticism as governments may revert to increased taxation and exchange rate changes. However, a study by Romero and Burkey (2011) reveal that low foreign public debt levels can have positive impact on economic growth.

The repercussions of sovereign debt on economic performance is not restricted to foreign debt, but it also comprises domestic debt. According to Beaugrand *et al.* (2002), domestic public debt to finance fiscal gap may be more costly than concessionary foreign public debt, owing to its crowding-out effect on private sector investment – induced by high domestic interest rates (see also Diamond, 1965). When governments borrow excessively from local debt markets, it will be using domestic private savings to fund its recurrent expenditures – mostly consumptive – thus reducing financial resources available for private lending (Ewaida, 2017). The disproportionate domestic public borrowing can lead to high debt servicing costs, especially when foreign interest rates are lower than local ones (World Bank, 2001).

According to the IMF (2012), the rise in domestic interest rates may be more striking if the investor base is ordinarily narrow and exceptionally concentrated (see also Arnone and Presbitero, 2010). Further, Fischer and Easterly (1990) purport that, if interest rates are administered, government borrowing on the domestic markets may cause disproportionate credit apportionment and crowding-out of private sector investment. Contrary to these views, Arnone and Presbitero (2008) state that domestic public debt reduces both heavy dependence on foreign aid and sovereign exposure to interest rate and currency risks, and also limits external financial outflows. Hence, domestic public borrowing can help deepen money and financial markets, and thus assist in savings mobilisation (Gulde *et al.*, 2006; Moss *et al.*, 2006).

Compared to foreign public debt, domestic public debt tends to have prohibitive interest rates, which entail higher public debt service costs; and short maturity periods, which aggravate fiscal imbalances and default risks (Akemann and Kanczuk, 2005). Thus, according to Bua *et al.* (2014), most developing countries are trading currency mismatch risk for maturity mismatch risk.

4. Estimation Techniques and Empirical Analysis

4.1 Empirical Model Specification

In this section, the dynamic impact of public debt and economic growth, and domestic vs. foreign public debt on economic growth in Zambia is analysed using the autoregressive distributed lag (ARDL) bounds testing methodology. The ARDL bounds testing technique is adopted in this study over alternative conventional cointegration methods in view of its several strengths. First, whereas the other conventional cointegration methods require that regression variables be of equal order of integration, the ARDL procedure can produce meaningful and reliable parameters as long as the predictor variables are purely integrated of at most one or a mixture of orders one and zero (Narayan, 2004).

Second, unlike in conventional cointegration testing methods, which use a system of equations, the ARDL methodology is parsimonious as it applies only a single reduced form equation (see Pesaran and Shin, 1999). Third, the ARDL testing procedure yields robust results even in small or finite data sample sizes, unlike the Engle and Granger (1987) test and the Full-Maximum Likelihood (FML) test which are responsive to the sample magnitude (Odhiambo, 2009). Finally, an ARDL technique estimates simultaneously the short-run and long-run parameters and still yields parameters that are consistent and unbiased (Shrestha and Chowdhury, 2007).

Table 1: Summary of Regression Variables

Notation	Variable description
y	Annual growth rate of real GDP per capita (a proxy for economic growth)
PD	Percentage of public debt in GDP (a proxy for public debt)
DPD	Percentage of domestic public debt in GDP (a proxy for domestic public debt)
FPD	Percentage of foreign public debt in GDP (a proxy for foreign public debt)
I	Percentage of gross fixed capital formation in GDP (a proxy for gross domestic investment)
L	Percentage of economically active population aged between 15 and 64 years in total working age population (a proxy for labour)
FB	Percentage of fiscal balance in GDP (a proxy for fiscal balance)
TOP	Sum of imports and exports as ratio of GDP (a proxy for trade openness)
S	Percentage of gross domestic savings in GDP (a proxy for savings)
TOT	Percentage of trade balance in GDP (a proxy for terms of trade)

In light of these strengths, the ARDL procedure is a well-suited method for investigating the underlying relationships specified in this study. The study employs two models – Model 1 scrutinises the impact of public debt on economic growth, while Model 2 explores the relative impact of domestic and foreign public debt on economic growth. For the purpose of fully specifying the models (Model 1 and Model 2), six control variables were added to each model. These additional control variables are gross domestic investment (I), labour (L), fiscal balance (FB), trade openness (TOP), domestic savings (S), and terms of trade (TOT). According to the exogeneous, endogenous, Keynesian and neoclassical economic growth theories, the six added explanatory variables positively affect economic growth (see Checherita-Westphal and Rother 2012; Greiner, 2011; Berg and Krueger, 2003; Fischer, 1992; 1993; Khan, 1987; Lucas, 1988) – implying that their coefficients are also projected to be positive. The regression variables in the two models are summarised in Table 1.

The two ARDL models and their associated error correction (ECM) models are specified in equations 1 to 4 as follows:

ARDL specification for Model 1: Impact of public debt on economic growth

$$\Delta y_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta y_{t-i} + \sum_{i=0}^{n} \alpha_{2i} \Delta PD_{t-i} + \sum_{i=0}^{n} \alpha_{3i} \Delta I_{t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta L_{t-i} + \sum_{i=0}^{n} \alpha_5 \Delta FB_{t-i} + \sum_{i=0}^{n} \alpha_6 \Delta TOP_{t-i} + \sum_{i=0}^{n} \alpha_{7i} \Delta S_{t-i} + \sum_{i=0}^{n} \alpha_{8i} \Delta TOT_{t-i} + \sigma_1 y_{t-1} + \sigma_2 PD_{t-1} + \sigma_3 I_{t-1} + \sigma_4 L_{t-1} + \sigma_5 FB_{t-1} + \sigma_6 TOP + \sigma_7 S_{t-1} + \sigma_8 TOT_{t-1} + \mu_{1t} \quad (1)$$

Where α_0 is a constant; $\alpha_1 - \alpha_8$ and $\sigma_1 - \sigma_8$ are short-run and long-run regression coefficients, respectively; Δ denotes a change; n are lag lengths; μ_{1t} is white-noise error term; and t is time period.

ECM specification for Model 1: Impact of public debt on economic growth

$$\Delta y_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta y_{t-i} + \sum_{i=0}^{n} \alpha_{2i} \Delta PD_{t-i} + \sum_{i=0}^{n} \alpha_{3i} \Delta I_{t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta L_{t-i} + \sum_{i=0}^{n} \alpha_{5i} \Delta FB_{t-i} + \sum_{i=0}^{n} \alpha_{6i} \Delta TOP_{t-i} + \sum_{i=0}^{n} \alpha_{7i} \Delta S_{t-i} + \sum_{i=0}^{n} \alpha_{8i} \Delta TOT_{t-i} + \omega_1 ECM_{t-1} + \mu_{2t} \quad (2)$$

Where α_0 is a constant; $\alpha_1 - \alpha_8$ and ω_1 are regression coefficients; Δ denotes a change; n are lag lengths; μ_{2t} is white-noise error term; ECM_{t-1} is the error-correction term lagged once; and t is time period.

ARDL specification for Model 2: Relative impact of domestic and foreign public debt on economic growth

$$\Delta y_t = \lambda_0 + \sum_{i=1}^{n} \lambda_{1i} \Delta y_{t-i} + \sum_{i=0}^{n} \lambda_{2i} \Delta DPD_{t-i} + \sum_{i=0}^{n} \lambda_{3i} \Delta FPD_{t-i} + \sum_{i=0}^{n} \lambda_{4i} \Delta I_{t-i} + \sum_{i=0}^{n} \lambda_{5i} \Delta L_{t-i} + \sum_{i=0}^{n} \lambda_{6i} \Delta FB_{t-i} + \sum_{i=0}^{n} \lambda_{7i} \Delta TOP_{t-i} + \sum_{i=0}^{n} \lambda_{8i} \Delta S_{t-i} + \sum_{i=0}^{n} \lambda_{9i} \Delta TOT_{t-i} + \rho_1 y_{t-1} + \rho_2 DPD_{t-1} + \rho_3 FPD_{t-1} + \rho_4 I_{t-1} + \rho_5 L_{t-1} + \rho_6 FB_{t-1} + \rho_7 TOP_{t-1} + \rho_8 S_{t-1} + \rho_9 TOT_{t-1} + \mu_{3t} \quad (3)$$

Where λ_0 is a constant; $\lambda_1 - \lambda_8$ and $\rho_1 - \rho_8$ are short-run and long-run regression coefficients, respectively; Δ denotes a change; n are lag lengths; μ_{3t} is white-noise error term; and t is time period.

ECM specification for Model 2: Relative impact of domestic and foreign public debt on economic growth

$$\Delta y_t = \lambda_0 + \sum_{i=1}^{n} \lambda_{1i} \Delta y_{t-i} + \sum_{i=0}^{n} \lambda_{2i} \Delta DPD_{t-i} + \sum_{i=0}^{n} \lambda_{3i} \Delta FPD_{t-i} + \sum_{i=0}^{n} \lambda_{4i} \Delta I_{t-i} + \sum_{i=0}^{n} \lambda_{5i} \Delta L_{t-i} + \sum_{i=0}^{n} \lambda_{6i} \Delta FB_{t-i} + \sum_{i=0}^{n} \lambda_{7i} \Delta TOP_{t-i} + \sum_{i=0}^{n} \lambda_{8i} \Delta S_{t-i} + \sum_{i=0}^{n} \lambda_{9i} \Delta TOT_{t-i} + \omega_2 ECM_{t-1} + \mu_{4t} \quad (4)$$

Where λ_0 is a constant; $\lambda_1 - \lambda_8$ and ω_2 are regression coefficients; Δ denotes a change; n are lag lengths; μ_{4t} is white-noise error term; ECM_{t-1} is the error-correction term lagged once; and t is time period.

4.2 Data Sources

This study utilised annual time-series data stretching from 1970 to 2017. The primary source of the data in this study is the World Bank Development Indicators, 1970-2017 (World Bank, 2017b) where annual growth rate of real GDP per capita (y), gross public debt (PD), gross fixed capital formation (I), labour participation rate (L), fiscal balance (FB), trade openness (TOP), savings (S) and terms of trade (TOT) were retrieved. Domestic and foreign public debt were acquired from the electronic database of the Bank of Zambia (Bank of Zambia, 2017b).

4.3 Stationarity Tests

Similar to other time series data techniques, this study performed stationarity tests using the Dickey-Fuller Generalised Least Square (DF-GLS), the Phillips-Perron (PP) and the Perron (PPURoot) unit root tests. The lag lengths in DF-GLS, PP and PPURoot were spontaneously chosen by Schwarz Information Criterion (SIC), Newey-West bandwidth and Perron Unit Root test truncation lag techniques, respectively. The stationarity tests were performed to establish the order of integration in the series. The results of stationarity checks are reported in Table 2.

The stationarity results reported in Table 2 tend to differ depending on the unit root testing method used. Overall, the results confirm that all the variables are either stationary in levels, *I(0)* or in first difference, *I(1)*, thus validating the aptness of the ARDL bounds estimation technique.

4.4 Bound F-statistic Test Results

In this section, the existence or nonexistence of a long-run relationship between the regression variables in the two models is analysed using a bounds F-statistic test. The results of the bounds F-statistic test are displayed in Table 3.

Table 3: ARDL-bounds Test for Cointegration Results – Models 1 and 2

Model	**Dependent variable**	**Function**				**F-statistic**	**Cointegration status**
1	y	F(y| PD, I, L, FB, TOP, S, TOT)				4.614***	Cointegrated
2	y	F(y| DPD, FPD, I, L, FB, TOP, S, TOT)				4.161***	Cointegrated
Asymptotic critical values (Unrestricted intercept and no trend)							
Pesaran *et al.* (2001: 300) critical values		10%		5%		1%	
		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
[Table CI(iii) Case III]: Model 1		2.03	3.13	2.32	3.50	2.96	4.26
[Table CI(iii) Case III]: Model 2		1.95	3.06	2.22	3.39	2.79	4.10

*Note: *** denotes statistical significance at 1% level.*

The calculated F-statistic values for Model 1 and Model 2 reported in Table 3 are 4.614 and 4.161, respectively. These values are all above the respective upper bound Pesaran *et al*. (2001: 300) critical values of 4.26 and 4.10 at 1% significance level. The cointegration results, therefore, substantiate the existence of a long-run stable association between public debt and economic growth, and between domestic and foreign public debt and economic growth, hence, the study proceeds to empirically estimate the models.

Table 2: Stationarity Test Results

Variable	Dickey-Fuller Generalised Least Square (DF-GLS) Test				Phillips-Perron (PP) Test				Perron, 1997 (PPURoot) Test			
	Stationarity of all variables in levels		Stationarity of all variables in first difference		Stationarity of all variables in levels		Stationarity of all variables in first difference		Stationarity of all variables in levels		Stationarity of all variables in first difference	
	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend
y	-3.295***	-6.219***	-	-	-5.592***	-6.116***	-	-	-6.831***	-6.917***	-	-
PD	-1.890*	-2.616	-	-6.131***	-1.857	-2.689	-7.378***	-7.442***	-4.194	-4.157	-8.257***	-8.169***
DPD	-0.357	-1.402	-6.029***	-6.620***	-1.096	-1.367	-6.748***	-6.711***	-4.183	-4.045	-9.735***	-9.748***
FPD	-1.318	-1.383	-5.424***	-5.538***	-1.521	-1.451	-5.239***	-5.860***	-3.335	-4.748	-8.244***	-8.345***
I	-1.078	-1.394	-6.476***	-6.771***	-1.065	-1.436	-6.576***	-6.819***	-6.979***	-6.865***	-	-
L	-1.615	-2.039	-1.866*	-2.900*	-1.702	-0.164	-5.930***	-7.617***	-3.860	-3.668	-5.361*	-5.480*
FB	-3.267***	-5.167***	-	-	-3.302**	-5.204***	-	-	-5.802**	-8.534***	-	-
TOP	-2.045**	-2.874	-	-6.307***	-2.888**	-2.999	-	-10.254***	-3.084	-3.292	-6.812***	-6.787***
S	-1.538	-1.982	-5.953***	-7.935***	-2.714*	-2.862	-	-10.161***	-4.864	-5.109	-8.906***	-9.087***
TOT	-1.513	-3.263**	-4.570***	-	-3.532**	-3.272*	-	-	-6.897***	-7.717***	-	-

*Note: *, ** and *** signify stationarity at 10%, 5% and 1% significance levels, respectively.*

4.5 Impact Analysis

Following the confirmation of long-run relationships among the regression variables in Models 1 and 2, the next step is to estimate the models using the ARDL method. The optimal lag length for the ARDL Model 1 and Model 2 were selected based on AIC technique. Based on the model's explanatory predictive power, the study selected AIC-based ARDL (1, 1, 2, 0, 3, 0, 3, 2) for Model 1 and AIC-based ARDL (3, 3, 2, 3, 3, 2, 2, 3, 1) for Model 2. The long- and short-run regression coefficients are reported in Table 4.

The long-run results for Model 1, reported in Table 4 Panel A, indicate that the coefficient of public debt (PD) is positive and statistically significant at 10% significance level. This implies that public debt has a positive long-run impact on economic growth (y) in Zambia. The finding suggests that public debt in Zambia has, on average, largely been used to expand the tradable sector. In other words, the results suggest that a considerable amount of public debt may have been financing capital expenditure, thereby impacting positively to aggregate economic activity.

The adoption of stringent expenditure, financial, economic and debt reforms since the late 1990s might have helped to reduce and, in some instances, maintain sustainable public debt levels and to channel new debt into productive sectors (IMF, 2017a; MOF, 2014; Government of Zambia/GRZ, 2007, World Bank, 2001). For instance, in 2004, the country implemented several private investment growth initiatives under the Private Sector Development Reform Program (PSDRP), while newly contracted government debt was committed to energy sector expansion and transport sector development (GRZ, 2017; 2004). This finding, although contrary to the study expectations, compares favourably with other earlier studies on the topic, such as Gómez-Puig, and Sosvilla-Rivero (2018), Dreger and Reimers (2013), DeLong and Summers (2012), and Romero and Burkey (2011), among others.

Table 4: Long-run and short-run results – Models 1 and 2

Panel A: Long-run coefficients (Explained variable is *y*)				
	Model 1		**Model 2**	
Regressors	**Coefficient**	**T-ratio**	**Coefficient**	**T-ratio**
C	-12.090***	-2.932	-41.300***	-3.105
PD	0.019*	1.755	-	-
DPD	-	-	-0.047***	-3.037
FPD	-	-	0.022**	2.709
I	0.249*	1.888	0.439*	1.771
L	0.089*	1.725	0.315	1.668
FB	-0.446*	-1.707	0.235	1.378
TOP	-0.334**	-2.534	-0.317**	-2.948
S	0.537*	1.924	0.285*	1.891
TOT	-0.123	-0.231	-0.592**	-2.496
Panel B: Short-run coefficients (Explained variable is Δ*y*)				
Regressors	**Coefficient**	**T-ratio**	**Coefficient**	**T-ratio**
Δy(1)	-	-	0.193**	2.675
Δy(2)	-	-	0.160	1.037
ΔPD	0.042*	2.015	-	-

ΔDPD	-	-	-0.134	-0.329
ΔDPD(1)	-	-	-0.089**	-2.512
ΔDPD(2)	-	-	-0.157***	-2.986
ΔFPD	-	-	-0.001	-0.036
ΔFPD(1)	-	-	0.083***	3.839
ΔI	0.273*	1.787	0.571***	3.341
ΔI(1)	0.223*	1.855	0.036	0.198
ΔI(2)	-	-	-0.266*	-1.752
ΔL	0.823	1.614	0.232***	3.365
ΔL(1)	-	-	-0.574	-1.141
ΔL(2)	-	-	0.344	1.489
ΔFB	-0.076	-0.743	0.026	0.202
ΔFB(1)	0.182	1.337	-0.305***	-3.086
ΔFB(2)	-0.181**	-2.050	-	-
ΔTOP	-0.322**	-2.513	-0.226**	-2.615
ΔTOP(1)	-	-	-0.119	-1.081
ΔS	0.190	1.237	0.402***	3.467
ΔS(1)	-0.054	-0.353	-0.130***	-2.959
ΔS(2)	0.200*	1.808	-0.315	-1.668
ΔTOT	0.382	0.842	0.300***	3.105
ΔTOT(1)	-0.883*	-1.955	-	-
ECM(-1)	-0.263***	-5.481	-0.485***	-4.931
	Model 1		**Model 2**	
R-squared	0.772		0.907	
R-bar-squared	0.523		0.707	
F-statistic	4.700		4.545	
Prob (F-statistic)	0.001		0.002	
DW statistic	1.742		1.731	
SE of Regression	3.433		2.446	
Residual Sum of Squares	94.615		83.726	
Akaike Info. Criterion	-86.1299		-108.822	
Schwartz Bayesian Criterion	-104.195		-136.825	

*Note that: * = 10%, ** = 5%, and *** = 1% statistical significance.* Δ = first difference operator.

The short-run results for Model 1, reported in Table 4 Panel B, show that the coefficient of public debt (ΔPD) is positive and statistically significant at 10% significance level. This implies that an upsurge in public debt in Zambia in the current period can bring about an increase in economic growth in the short run. This finding compares favourably with other recent empirical studies by Gómez-Puig, and Sosvilla-Rivero (2018) and Dreger and Reimers (2013), among others. The short-run results of other variables for Model 1, reported in Table 4 Panel B, reveal that the coefficients of investment (ΔI and ΔI(1)) are positive as anticipated and statistically significant at 10% significance level. This finding suggests that a rise in investment in the current and previous periods can enhance economic growth in the short run. Further, the short-run results reveal that labour (ΔL) has no significant impact on economic growth in the short run in Zambia.

Also, the short-run results for Model 1 show that the coefficients of fiscal balance (ΔFB(2)) and terms of trade (ΔTOT(1)) are negative and statistically significant at 5% and 10% level, respectively. This suggests that fiscal balance and terms of trade in the past period have a negative impact on economic growth in the short run. Furthermore, the short-run coefficient of trade openness (ΔTOP(1)) is negative and statistically significant at 5%. This outcome

suggests that an increase in trade openness in the current period has a negative impact on economic growth in the short run in Zambia. Finally, as anticipated, the error correction term ECM(-1) turns out to be negative and statistically significant at 1%, implying that in the event of a shock to the Zambian economy, economic growth adjusts to equilibrium at a rate of 26.3% per annum.

The empirical results of Model 2, reported in Table 4 Panel A, indicate that the long-run relative impact of public debt on economic growth in Zambia is dependent on the type of debt under consideration – that is, whether it is domestic or foreign public debt. Whereas domestic public debt negatively affects long-run economic growth, foreign public debt positively impacts economic growth in Zambia. The negative impact of domestic public debt on economic growth may be due to the crowding-out effect of government borrowing on domestic capital markets – further suggesting that the financial markets of Zambia are still narrow and illiquid (see Arnone and Presbitero, 2010; Chartered Accountants and Management Consultants, 2006; McCulloch *et al.,* 2000). As stated in Dahou *et al.,* (2009), in shallow financial markets, a rise in domestic public debt limits access to long-term financing for private borrowers, leading to depressed capital accumulation, economic growth and welfare (see also Atique and Malik, 2012). In contrast, the positive long-run impact of foreign public debt on economic growth in Zambia might have started after 2006 when the country embarked on long-term borrowing largely for productive purposes (GRZ, 2015).

The long-run empirical results of other variables in Model 2 show that the coefficients of investment (I) and savings (S) are as projected, positive and statistically significant at 10% significance level. Unexpectedly, the coefficients of trade openness (TOP) and terms of trade (TOT) are negative but statistically significant at 5% significance level. Furthermore, the long-run regression coefficients of labour (L) and fiscal balance (FB) turns out to be statistically insignificant.

The short-run results for Model 2, reported in Table 4 Panel B, show that the coefficients of domestic public debt in previous periods (ΔDPD(1) and ΔDPD(2)) are negative and statistically significant. This suggests that a rise in domestic public debt in the previous period in Zambia can lead to economic decline in the short run. This finding infers that domestic public debt has a net crowding-out effect on economic growth in Zambia in the short run. Further, the short-run coefficient of foreign public debt (ΔFPD(1)) is positive and statistically significant at 1% significance level. This result implies that foreign public debt in the past period has an unexpected positive impact on economic growth in the short run.

The short-run results of other variables in Model 2 reveal that the coefficients of investment (ΔI), labour (ΔL), savings (ΔS) and terms of trade (ΔTOT) are positive and statistically significant. This outcome reveals that investment, labour, savings and terms of trade in the current period positively impact economic growth in the short run. Furthermore, economic growth in the past period (Δy(1)) positively affects economic growth in the short run. The short-run results for Model 2 also reveal that investment (ΔI(2)), fiscal balance (ΔFB(1)) and savings (ΔS(1)) in the previous periods negatively influence economic growth in the short run. The impact of trade openness (ΔTOP) on economic growth in the current period is unpredictably found to be negative and statistically significant. Finally, as anticipated, the error correction term ECM(-1) was found to be negative and statistically significant at 1%, implying that in the event of a shock to the Zambian economy, economic growth adjusts to equilibrium at a rate of 48.5% per annum.

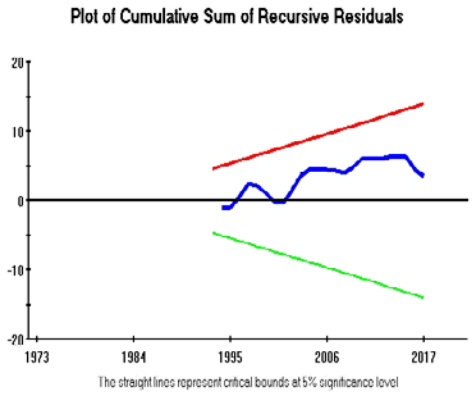
Four diagnostic tests, namely, serial correlation, functional form, normality and heteroscedasticity, were performed on the ECM-based ARDL Models 1 and 2; and the outcomes are presented in Table 5.

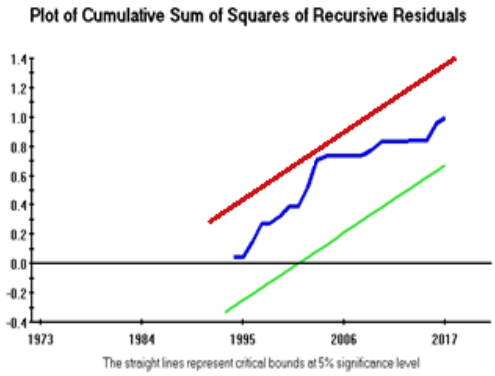
Table 5: Diagnostic Test Results (Models 1 and 2)

LM test statistic	Results [Probability]	
	Model 1	**Model 2**
Serial Correlation: CHSQ (1)	0.493 [0.483]	2.091 [0.148]
Functional Form: CHSQ (1)	0.735 [0.391]	0.282 [0.595]
Normality: CHSQ (2)	0.892 [0.640]	1.534 [0.465]
Heteroscedasticity: CHSQ (1)	0.484 [0.487]	0.041 [0.839]

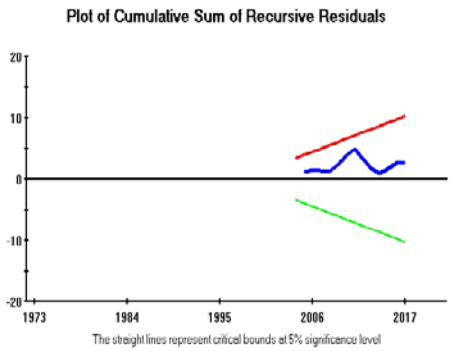
Figure 3: Plot of CUSUM and CUMUMSQ (Models 1 and 2)

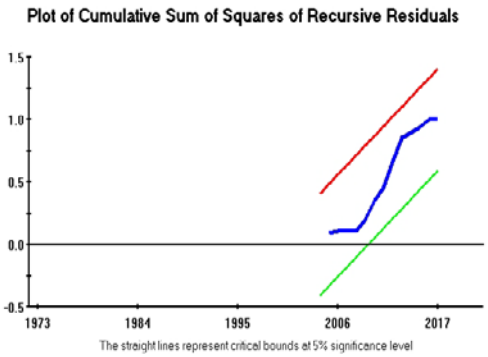
Panel A: Model 1: Impact of public debt on economic growth





Panel B: Model 2: Relative impact of domestic and foreign public debt on economic growth





The results shown in Table 5 indicate that both models passed all the four diagnostic tests carried out. This means that the estimated parameters in the two models are consistent and reliable. Further, to test the null hypothesis of model stability, the study plotted the Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUMUMSQ) for Model 1 and Model 2 and the results are displayed in Figure 3 Panels A and B, respectively.

Figure 3 shows that the CUSUM and CUMUMSQ plots for the two models are generally stable at 5% significance level, thus failing to reject the null hypothesis of stability of the regression coefficients.

5. Conclusion

In this study, the impact of public debt on economic growth in Zambia was examined for the period from 1970 to 2017. Also examined was the relative impact of domestic and foreign public debt on Zambia's economic growth. The Zambian economy is among the fastest growing economies in SSA and the country is on track towards being an upper middle-income country as stated in the country's vision 2030 policy document (MOF, 2006). Of the many previous studies that were done on the relationship between public debt and economic growth in SSA, the majority focussed on the impact of foreign public debt on economic growth.

Therefore, this study differs from other previous empirical studies in that it analysed, in detail, how public debt and its components – domestic and foreign – impact on economic growth in Zambia. This approach allowed for an in-depth understanding of the public debt-economic growth nexus in this country. Further, unlike the previous studies that used the conventional cointegration approaches, mostly the Engle and Granger (1987) test and the Full-Maximum Likelihood (FML) test, which are sensitive to the size of the sample, this study employed the ARDL methodology which provides robust results even in small or finite data sample sizes.

The empirical results of this study reveal that public debt has a positive impact on economic growth in Zambia, both in the short run and in the long run. The results of the study further show that the relative impact of public debt on economic growth in Zambia is dependent on the type of debt under consideration, that is, whether it is domestic or foreign debt. Domestic public debt turns out to have a negative impact on economic growth, while its foreign counterpart had a positive impact, both in the short run and in the long run.

In line with the study findings, the study recommends the following: (1) strengthening of the Integrated Financial Management Information System, the Public Expenditure Tracking Surveys, and the Treasury Single Account systems to promote more efficient and sustainable domestic public debt levels; (2) upholding political will to ensure fiscal balance sustainability and channelling of borrowed funds to the tradable sector and to projects with high returns; (3) effective monitoring of government contingency liabilities to minimise fiscal risks (for example, comprehensive recording and analysis of all sovereign guarantees); (4) sound management of government debt composition and structure to reduce currency and maturity risks; (5) expansion of the country's investor base to enhance the flexibility and stability of the government's funding strategy; and (5) promoting gross investment and savings growth through effective monitoring and evaluation of public sector investments to ensure that they deliver value for money; and setting up of tax incentives that promote private sector participation in the economy.

Although this study has extended the current debate on the public debt-economic growth nexus by empirically testing the impact of public debt on economic growth, and

simultaneously estimating the relative impact of domestic and foreign public debt on economic growth in Zambia; there are some theoretical arguments suggesting that the relationship between public debt and economic growth may be nonlinear. Hence, it would be interesting for future studies on the subject to test the existence (or nonexistence) of nonlinear relationships between public debt and economic growth and to determine the threshold points in this study country.

References

Abbas, A.S.M., and Christensen, J.E., 2007. The role of domestic debt markets in economic growth: An empirical investigation for low-income countries and emerging markets. IMF Working Papers No. 07/127, International Monetary Fund, Washington DC, USA.

Abu-Bakar, N., and Hassan, S., 2008. Empirical evaluation on external debt of Malaysia. *International Business and Economics Research Journal*, 7(2), 95-108.

African Forum and Network on Debt and Development. 2011. Domestic debt management in Africa: The case of Zambia. African Forum and Network on Debt and Development, Harare, Zimbabwe.

Akemann, M., and Kanczuk, F., 2005. Sovereign default and the sustainability risk premium effect. *Journal of Development Economics*, 76(1), 53-69.

Arnone, M., and Presbitero, A.F., 2008. External debt sustainability and domestic debt in heavily indebted poor countries. *Rivista Internazionale di Scienze Sociali*, 115(2), 187-213.

Arnone, M., Presbitero, A., 2010. *Debt Relief Initiative: Policy Design and Outcomes*. Ashgate Publishing Co., Farnham.

Arrow, K., and Kurz, M., 1970. *Public investment, the rate of return, and optimal fiscal policy*. John Hopkins Press, Baltimore, USA.

Atique, R., and Malik, K., 2012. Impact of domestic and external debt on the economic growth of Pakistan. *World Applied Sciences Journal*, 20(1), 120-129.

Balcilar, M., 2012. The difficult quest for an answer to low growth dilemma in Turkey: The channel of debt and productivity. *International Journal of Economic Perspectives*, 6(4), 93-113.

Bank of Zambia., 2015. Zambia's Public Debt. *The Intosai Working Group on Public Debt* (Pp. 1-17). Bank of Zambia. Livingstone, Zambia.

Bank of Zambia., 2017a. Monetary Policy Committee Statement for Q1 2017, February 2017. Bank of Zambia, Lusaka, Zambia.

Bank of Zambia., 2017b. Annual Reports *(various years).* Bank of Zambia, Lusaka, Zambia.

Barro, R.J., (1974). Are government bonds net wealth? *Journal of Political Economy*, 82(6), 1095-1117.

Baum, A., Checherita-Westphal, C., and Rother, P., 2012. Debt and growth: New evidence for the Euro Area, ECB Working Paper No. 1450, July 2012.

Beaugrand, P., Boileau L., and Monfort M., 2002. The choice between external and domestic debt in financing budget deficits: The Case of central and west African countries. IMF Working Paper No. 02/79, May 2002.

Berg, A., and Krueger, A., 2003. Trade, growth and poverty: A selective survey. Working Paper No. 03/30. International Monetary Fund, Washington DC, USA.

Borenzenstein, E., and Mauro, P., Ottaviani, M., and Claessens, S., 2004. The case for GDP-indexed Bonds. *Economic Policy*, 19(38), 165-216.

Broner, F., Aitor, E., Alberto, M., and Jaume, V., 2014. Sovereign debt markets in turbulent times: Creditor discrimination and crowding-out effects. *Journal of Monetary Economics*, 61, 114-142.

Bua, G., Pradellib, J., Presbitero, A.F., 2014. Domestic public debt in low-income countries: Trends and structure. *Review of Development Finance*, 4, 1-19.

Buchanan, J.M., 1976. Barro on the Ricardian Equivalence Theorem. *Journal of Political Economy*, 84 (2), 337-342.

Cecchetti, S., Mohanty, M.S., and Zampolli, F., 2011. Achieving growth amid fiscal imbalances: The real effects of debt in achieving maximum long-run growth - A symposium sponsored by The Federal Reserve Bank of Kansas City. Federal Reserve Bank of Kansas City.

Central Statistical Office (CSO)., 2017. October Monthly Report, Government of the Republic of Zambia, Lusaka, Zambia.

Chartered Accountants and Management Consultants., 2006. *Domestic Debt Policy and Reduction Strategy, Support for Fiscal Transparency and Accountability Programme.* Africa Development Bank, Lusaka, Zambia.

Checherita-Westphal, C., and Rother, P., 2010. The impact of high and growing government debt on economic growth. An empirical investigation for the Euro Area, ECB Working Paper No. 1237, August 2010.

Checherita-Westphal, C., and Rother, P., 2012. The impact of high government debt on economic growth and its channels: An empirical investigation for the euro area. *European Economic Review*, 56(7), 1392-1405.

Chenery, H.B., and Stout, A., 1966. Foreign assistance and economic development. *American Economic Review*, 55, 679-733.

Clements, B., Bhattacharya, R., and Nguyen, T.Q. (2003). External debt, public investment and growth in low-income countries. IMF Working Paper No. 03/249, International Monetary Fund Washington DC, USA.

Cochrane, J.H., 2011. Inflation and debt. *National Affairs*, 9, 56-78.

Cordella, T., Ricci, L.A., and Ruiz-Arranz, M., 2010. Debt overhang or debt irrelevance?" *IMF Staff Papers*, 57(1), 1-24.

Dahou, K., Omar, H.I., and Pfister, M., 2009. Deepening African financial markets for growth and investment. NEPAD-OECD Africa Investment Initiative, 11-12 November 2009.

DeLong, J.B., and Summers, L.H., 2012. Fiscal policy in a depressed economy. *Brookings Papers on Economic Activity,* 44 (1 (Spring), 233-297.

Diamond, P., 1965. National debt in a neoclassical growth model. *American Economic Review,* 55(5), 1126-1150.

Dogan, I., and Bilgili, F., 2014. The non-linear impact of high and growing government external debt on economic growth: A Markov Regime-switching approach. *Economic Modelling,* 39(C), 213-220.

Dreger, C., Reimers, H.E., 2013. Does euro area membership affect the relation between GDP growth and public debt? *Journal of Macroeconomics,* 38, 481-486.

Engle, R.F., and Granger, C.J., 1987. Cointegration and Error-Correction Representation, Estimation and Testing. *Econometrica*, 55 (2), 251-278.

Eberhardt, M., and Presbitero, A.F., 2015. Public debt and growth: Heterogeneity and non-linearity. *Journal of International Economics*, 97, 45-58.

Égert, B., 2012. Public debt, economic growth and nonlinear effects: Myth or Reality? OECD Economic Department Working Paper No. 993, 17 October 2012.

Égert, B., 2015. Public debt, economic growth and nonlinear effects: Myth or reality? *Journal of Macroeconomics*, 43, 226-238.

Ewaida, H.Y.M., 2017. The impact of sovereign debt on growth: An empirical study on GIIPS versus JUUSD Countries. *European Research Studie*s Journal, XX(2A), 607-633.

Fetter, F.W., 1980. The rise and decline of Ricardian Economics. *History of Political Economy*, 1, 111.

Fischer, S., and Easterly, W., 1990. The economics of the government budget constraint. *Oxford Journals*, 5(2), 127-142.

Fischer, S., 1992. Macroeconomic stability and growth. *Cuadernos de Economía*, 29(87), 171-186.

Fischer, S., 1993. The role of macroeconomic factors in growth. *Journal of Monetary Economics*, 32(3), 485-512.

Gómez-Puig, M., and Sosvilla-Rivero, S., 2018. Public debt and economic growth: Further evidence for the Euro area. *Acta Oeconomica*, 68(2), 209-229.

Government of the Republic of Zambia (GRZ)., 2004. *Private Sector Development Reform Programme 2006-2009*. Ministry of Finance, Lusaka, Zambia.

Government of the Republic of Zambia., 2006. *Fifth National Development Plan 2006-2010*. Ministry of Finance, Lusaka, Zambia.

Government of the Republic of Zambia., 2007. External Debt Operations Reports: Investments and Debt Management. Ministry of Finance, Lusaka, Zambia.

Government of the Republic of Zambia., 2015. Presidential statement on measures to restore macroeconomic stability, job losses on the mines and general overview of the state of the nation, 26 November 2015, Lusaka, Zambia.

Greiner, A., 2011. Economic growth, public debt and welfare: Comparing three budgetary rules. *German Economic Review*, 12(2), 205-222.

Gulde, A., Pattillo, C., and Christensen, J., 2006. *Sub-Saharan Africa: Financial Sector Challenges.* International Monetary Fund, Washington DC, USA.

Huang, Y., Panizza, U., and Varghese, R., 2018. Does public debt crowd-out corporate investment? international evidence, IHEID Working Papers 08-2018, Economics Section, The Graduate Institute of International Studies.

International Bank for Reconstruction and Development., 2017. 10th Zambia Economic Brief: How Zambia can borrow without sorrow**.** The International Bank for Reconstruction and Development/The World Bank.

International Monetary Fund (IMF)., 2012. *The Joint World Bank–IMF Debt Sustainability Framework for Low-Income Countries.* International Monetary Fund, Washington DC, USA.

International Monetary Fund., 2017a. 2017 Article IV Consultation, IMF country Report No. 17/327. International Monetary Fund, Washington DC, USA.

International Monetary Fund., 2017b. World Economic Outlook data. International Monetary Fund, Washington DC, USA.

Khan, M.S., 1987. Macroeconomic Adjustment in developing countries: A policy perspective. *World Bank Research Observer*, 2, 23-42.

Kobayashi, K., 2015. Public Debt Overhang and Economic Growth, Policy Research Institute. *Public Policy Review*, 11(2), 247-276.

Kourtellos, A., Stengos, T., and Tan, C.M., 2013. The effect of public debt on growth in multiple regimes. *Journal of Macroeconomics*, 38, 35-43.

Krugman, P., 1988. Financing vs. forgiving a debt overhang. *Journal of Development Economics*, 29(3), 253-268.

Lof, M., Malinen, T., 2014. Does sovereign debt weaken economic growth? A panel VAR analysis. *Economics Letters*, 122(3), 403-407.

Lucas, R.E., 1988. On the mechanics of economic development. *Journal of Monetary Economics*, 2, 3-42.

McCulloch, N., Baulch, B., and Cherel-Rob, M., 2000. *Poverty, inequality and growth in Zambia during the 1990s.* IDS Publications Office, Institute of Development Studies, University of Sussex.

McKinnon, R.E., 1964. Foreign Exchange Constraints in Economic Development and Efficient Aid Allocation. *Economic Journal*, 74, 388-409.

Minea, A., and Parent, A., 2012. Is high public debt always harmful to economic growth? Reinhart and Rogoff and Some Complex Nonlinearities. CERDI Working Paper No. 2012/18, February 2012.

Ministry of Finance (MOF)., 2006. VISION 2030: A prosperous Middle-income Nation by 2030. Government of the Republic of Zambia, Lusaka, Zambia.

Ministry of Finance., 2014. Green Paper, the Proposed Medium-Term Expenditure Framework and Policies for the 2015 Budget, August 2014. Government of the Republic of Zambia, Lusaka, Zambia.

Ministry of Finance., 2017. Mid-Year Economic Review. Government of the Republic of Zambia, Lusaka, Zambia.

Modigliani, F., 1961. Long-run implications of alternative fiscal policies and the burden of the national debt. *Economic Journal*, 71(4), 730-755.

Moss, T.J., and Chiang, H.S., 2003. The other costs of high debt in poor countries: Growth, Policy Dynamics, and Institutions. Issue paper on debt sustainability. Centre for Global Development, Washington DC, USA.

Moss, T., Pettersson, N., and de Walle, N.V., 2006. An aid-institutions paradox? Centre for Global Development Working Paper No. 74. Centre for Global Development, Washington DC, USA.

Myers, S.C., 1977. Determinants of corporate borrowing. *Journal of Financial Economics*, 5, 147-175.

Narayan, P.K., 2004. Fiji's tourism demand: The ARDL approach to cointegration. *Tourism Economics*, 10(2), 193-206.

Nguyen, T.Q., Clements, M.B.J., Bhattacharya, M.R., 2003. External debt, public investment, and growth in low-income countries (No. 3-249). International Monetary Fund.

Odhiambo, N.M., 2009. Energy consumption and economic growth nexus in Tanzania: An ARDL bounds testing approach. *Energy Policy*, 37, 617-622.

Panizza, U., and Presbitero, A.F., 2013. Public debt and economic growth in advanced economies: A survey. *Swiss Journal of Economics and Statistics*, 149(2), 175-204.

Pattillo, C., Poirson, H., and Ricci, L., 2002. External debt and growth. IMF Working Paper 02/69, International Monetary Fund, Washington DC, USA.

Patinkin, D., 1965. *Money, Interest and Prices*. 2nd Edition. Harper and Row, New York.

Pesaran, M.H., and Shin, Y., 1999. An autoregressive distributed lag modelling approach to cointegration analysis. In: Storm, S. (Ed.) *Econometrics and Economic Theory in the 20th Century*: The Ragnar Frisch Centennial Symposium, Cambridge University Press, Chapter 11, 1-31.

Pesaran, M.H., Shin, Y., and Smith, R., 2001. Bound testing approaches to the analysis of level relationship. *Journal of Applied Econometrics*, 16(3), 174-189.

Rebelo, S., 1995. Long-run policy analysis and long-run growth. *Journal of Political Economy*, 99(3), 500-521.

Reinhart, C.M., and Rogoff, K.S., 2010a. Growth in a time of debt. *American Economic Review*, 100(2), 573-578.

Reinhart, C.M., and Rogoff, K.S., 2010b. Debt and Growth Revisited. VoxEU.org, November 2010.

Reinhart, C.M., Reinhart, V.R., and Rogoff, K.S., 2012. Public debt overhangs: Advanced-economy episodes since 1800. *Journal of Economic Perspectives*, 26(3), 69-86.

Rodrik, D., 2008. The real exchange rate and economic growth. *Brookings Papers on Economic Activity*, 39(2), 365-439.

Romero, A., Burkey, M., 2011. Debt overhang and the eurozone: A spatial panel analysis. *The Review of Regional Studies*, 41(1), 49-63.

Sachs, J.D., 1989. The debt overhang of developing countries, in *Debt, stabilisation and development*, ed. by Calvo, G.A., Findlay, R., Kouri, P., and De Macedo, J.B. Basil Blackwell, Oxford.

Salotti, S., Trecroci, C., 2012. Even worse than you thought: The impact of government debt on aggregate investment and productivity. *Economica*, 83(330), 356-384.

Schclarek, A., 2004. Debt and economic growth in developing and industrial countries. Lund University Department of Economics Working Paper No. 34.

Shrestha, M.B., and Chowdhury, K., 2007. Testing financial liberalisation hypothesis with ARDL modelling approach. *Applied Financial Economics*, 17(18), 1529-1540.

Smith, G., Davies, F., and Chinzara, Z., 2016. Beating the slowdown: Reducing fiscal vulnerabilities for economic recovery. MFM Policy Note, September 2016.

Soydan, A., and Bedir, S., 2015. External debt and economic growth: New evidence for an old debate. *Journal of Business Economics and Finance*, 4(3), 500-522.

Uzun A., Kabadayi, B and Emsen, O.S., 2012. The impacts of external debt on economic growth in transition economies. *Chinese Business Review*, 11(5), 41-499.

Wagner, A., 1893. *Text and Handbook of Political Economy*. 3rd Edition. Leipzig, C.F. Winter.

World Bank., 2001. *Zambia public expenditure review: Public expenditure, growth and poverty: A synthesis*. World Bank, Washington DC, USA.

World Bank., 2016a. *Rising revenue for economic recovery*: *Zambia economic brief 8*. World Bank, Washington DC, USA.

World Bank., 2016b. *Beating the slowdown: Making every kwacha count, Zambia economic brief 7*. World Bank, Washington DC, USA.

World Bank., 2017a. *Macro-poverty outlook: Zambia*, October 2017, World Bank, Washington DC, USA.

World Bank., 2017b. World Bank Databank. World Development Indicators. Available at: <http://www.data.worldbank.org> [Accessed 11 November 2017].

Zaman, K., Alishah, I., Khan, M., and Ahmed, M., 2013. Impact of military expenditure and economic growth on external debt: New evidence from a panel of SAARC countries. *Journal of Economic and Social Studies*, 3(2), 131-146.