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THE IMPACT OF DOMESTIC AND FOREIGN PUBLIC DEBT ON ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM ZIMBABWE

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Abstract

This paper applies the autoregressive distributed lag (ARDL) approach to examine the impact of public debt (domestic and foreign) on economic growth in Zimbabwe for the period from 1970 to 2017. The study adds to the ongoing public debt-economic growth debate by testing the impact of the aggregated and disaggregated public debt on economic growth. The empirical results reveal that the impact of public debt on economic growth in Zimbabwe is negative, irrespective of whether public debt is aggregated or disaggregated, and irrespective of the type of debt – domestic or foreign. The study results further reveal that domestic public debt is more disastrous to the Zimbabwean economy than its foreign counterpart. These results are found to apply regardless of whether the regression analysis is performed in the short run or in the long run. The study recommends, among others, for the repealing of the government overdraft facility with the central bank.

Keywords: Public debt, domestic public debt, foreign public debt, economic growth, Zimbabwe, ARDL

JEL Classification : H62, H63, O47

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1. Introduction

Public debt, both domestic and foreign, is one of the key tenets of macroeconomic performance and financial stability of any country (Organisation for Economic Co-operation and Development (OECD), 2013). According to the OECD (2013: 3), government debt may directly convey or amplify shocks through the reactiveness of economic agents to changes in macroeconomic conditions. Thus, the process of public debt build-up and its repayment process influences the savings culture of the citizens, the investment environment, the consumption patterns, the performance of the financial sector and the nature of international relations (see Karazijienė, 2015; OECD, 2013).

From the beginning of the global financial crisis in 2007, to 2015, there has been a rapid change in the structure and composition of public debt in both developing and developed countries (Ostry *et al.,* 2015: 6). Public debt grew from an average of 70% to 105% of gross domestic product (GDP) in developed economies, and from an average of 36% to 49% of GDP in developing countries (International Monetary Fund (IMF), 2018: 19). Zimbabwe was not an exception in the amassing of public debt during this period. Similar to numerous other sub-Saharan African countries, Zimbabwe has been actively borrowing abroad and within to finance its fiscal gap (Ministry of Finance (MOF), 2018). However, some of the newly borrowed funds were used to settle old debts, mostly the IMF and the World Bank arrears, rather than financing investments or strengthening the local financial system (African Development Bank, 2018).

From the 1980s and 1990s, Zimbabwe borrowed extensively from domestic and international debt markets so that by the late 1990s, the country was in a severe debt overhang condition, resulting in massive accumulation of foreign debt arrears (Jones, 2011; IMF, 2011). As a result, there was a sudden drying-up of meaningful development assistance and cheap offshore finance as most traditional creditors – such as the World Bank, the IMF, the African Development Bank – shunned the country (Rehbein, 2012). The country, therefore, made a hasty turn to domestic debt market in 1998 and it also began to contract new non-concessionary loans from emerging creditors, mostly China and India (IMF, 2011).

During the period from 1990 – 2008, the country retired a substantial proportion of its domestic debt through a combination of hyperinflation and seignorage revenue (see Mupunga and Le Roux, 2015). However, after the adoption of a multicurrency system in February 2009, the

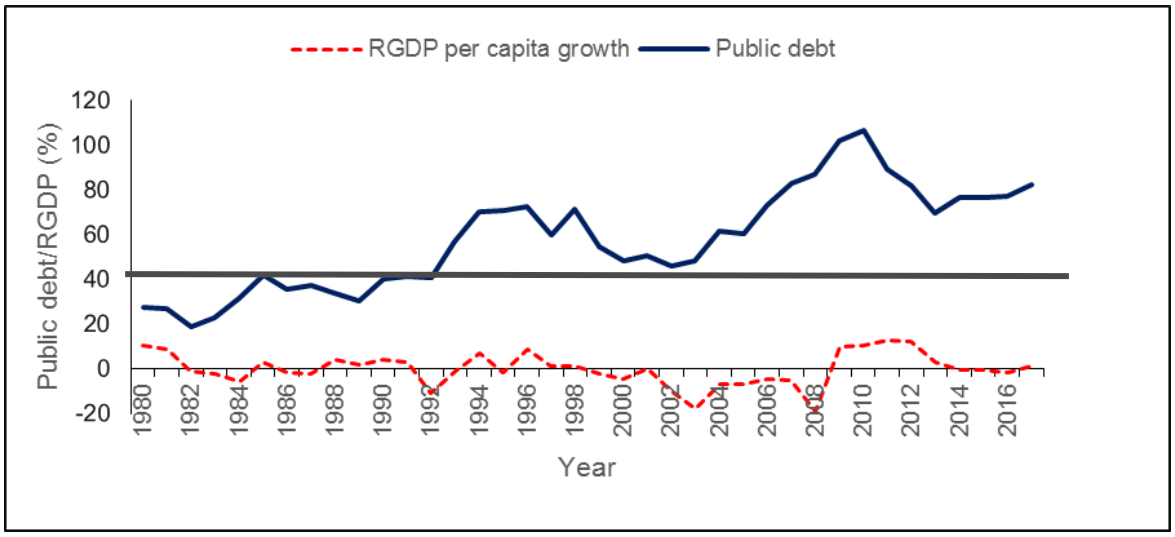
ability to use seignorage revenue to settle debts ceased and the country increased its reliance on foreign debt from new creditors (IMF, 2014). The re-emergence of domestic debt in 2012 and the continuous deterioration in both fiscal balance and current account balances further worsened the already heavy debt overhang condition in Zimbabwe (IMF, 2017a).

Despite such alarming public debt dynamics, Zimbabwe does not have much coverage on the debt-growth studies. A few studies that exist on this subject in Zimbabwe focused mostly on threshold effects and foreign debt (see, for example, Mupunga and Le Roux, 2015; Jones, 2011). Against this background, this paper aims to empirically test the net effect of aggregate public debt and its components – domestic and foreign debt – on economic growth in Zimbabwe for the period from 1970 to 2017. The remainder is organised as follows: Section 2 analyses the trends in public debt and economic growth in Zimbabwe. Section 3 reviews related literature on debt-growth nexus. Section 4 outlines the study methodology, while Section 5 provides the empirical results and analysis. Lastly, Section 6 concludes the paper and offers policy suggestions.

2. Public Debt and Economic Growth Trends in Zimbabwe

Zimbabwe's public sector debt dates back to the 1980s when the country had unlimited access to both local and international debt markets. Presently, Zimbabwe is burdened with a cumulative public debt of US$17.7 billion as at end of August 2018 – with domestic and foreign public debt accounting for 54% and 46%, respectively (MOF, 2019: 33). Figure 1 shows the evolution of public debt and the associated economic growth pattern in Zimbabwe from 1980 to 2017. Public debt is expressed as a percentage of real gross domestic product (RGDP), while economic growth is measured by the annual growth rate of real GDP per capita.

Figure 1: Public Debt and Economic Growth Trends in Zimbabwe (1980-2017)



Source: World Bank (2018)

Figure 1 shows an upward trajectory of public debt to RGDP ratio from 1980 to 2017, which can be divided into two segments: 1980 – 1991 and 1992 – 2017. In the first segment, the ratio of public debt to real GDP was steadily growing but remained within the IMF indicative debt-sustainability threshold of 40%. During this period, 1980 – 1991, a mixture of exogenous and endogenous factors – such as post-war reconstruction initiatives, increased social welfare expenditures, civil war of the 1980s, rising world interest rates, and droughts in 1982 and 1985 – caused the noticeable growth in public indebtedness, over and above the fluctuations in economic growth rate, although the average period growth rate remained positive, averaging 1.9% (World Bank, 2018).

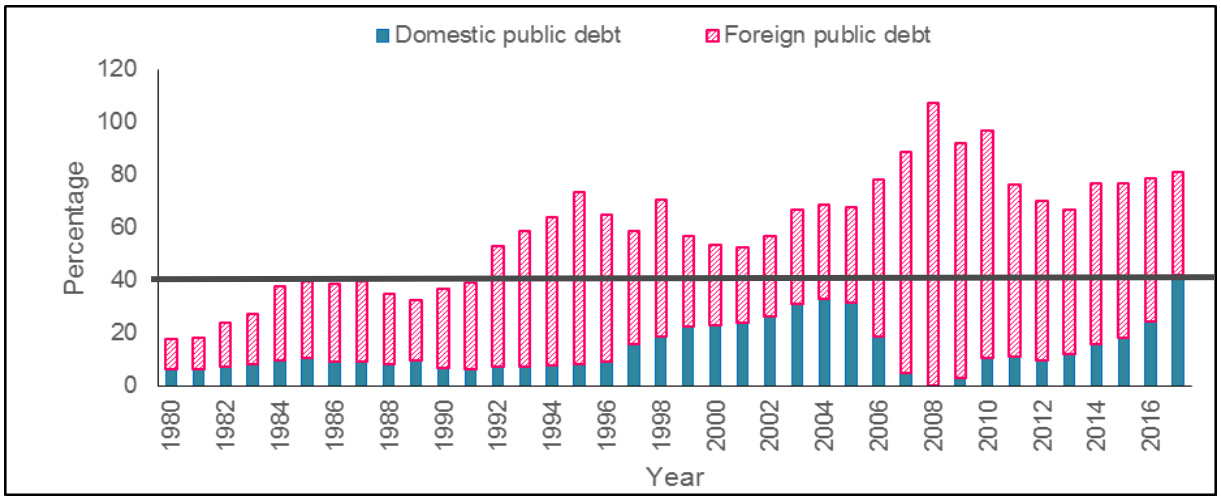
In the second segment, 1992 – 2017, public debt was growing swiftly, although it partially stabilised between 1995 and 1999. Despite the poor economic performance, the country made some partial debt repayments to the IMF and the World Bank in 2000 and 2001, leading to the fall in public debt to real GDP ratio, as seen in Figure 1 (Reserve Bank of Zimbabwe (RBZ), 2003). Generally, between 1997 and 2008, the country underwent massive deterioration in fiscal and current account balances and a cessation of cheap lines of credit from the international community (IMF, 2009). The period is thus characterised by a sharp increase in public debt, mostly from penalty charges arising from foreign payment arrears, together with new short-term non-concessionary credit facilities contracted by the country's Reserve Bank in the absence of sound official development support from the international donor community (RBZ, 2014; MOF, 2010a).

The economic rebound from 2009 to 2012 is concomitant with the plunge in public debt to real GDP ratio, reflecting an improvement in government's ability to repay its loans. During this period, the country started to make paltry debt repayments, mostly to the IMF, in an effort to increase the prospects of opening up new lines of credit (RBZ, 2015). Also, the adoption of the multicurrency system in 2009 reduced the domestic public debt component to almost zero. The stern liquidity challenges that were brought about by the multicurrency system made it impossible for the government to meaningfully borrow domestically, resulting in depressed volumes of domestic public debt between 2009 and 2013 (IMF, 2014).

From 2013 to 2017, public debt took an upward trajectory again. Although the country was making constant payments towards its IMF debt arrears, the growth in debt arrears from other creditors, such as African Development Bank, World Bank and the European Investment Bank, outpaced this reduction (MOF, 2018). Also, between 2013 and 2017, there is a noticeable economic growth slowdown arising mostly from foreign currency supply and allocation problems, exchange rate misalignment, and high inflationary pressures (IMF, 2017a; 2017b; MOF, 2018). As a result, the government increased its issuance of treasury bills and government bonds, further subjecting the country to a high debt maturity risk position (IMF, 2017a; RBZ, 2018a: 30).

Overall, an inspection of Figure 1 shows that from 1992 to 2017, Zimbabwe was strictly under severe debt burden emanating from both domestic and foreign public debt. To fully understand the dynamics of the public debt evolvement since 1980, the study now turns to the analysis of the Zimbabwean government debt profile. Figure 2 displays the structure of Zimbabwe's public debt from 1980 to 2017, expressed as ratio of real GDP.

Figure 2: Public Debt Structure in Zimbabwe (1980-2017)



Source: RBZ (2018b; 2014), MOF (2018).

From 1980 to 1996, there has been a gradual increase in foreign public debt while domestic public debt remained low, as shown in Figure 2. However, between 1996 and 2004 there is a noticeable rapid shift to domestic debt from foreign debt – a move which may have been necessitated by the drying up of official developmental finance by traditional creditors, particularly the IMF and the World Bank (IMF, 2011). After the government's fast-track land redistribution programme in 2000, the country was slapped with financial and economic sanctions (Richardson, 2004). The sanctions restricted the government's borrowing sources to the local capital markets and the Asian community (Stiftung, 2004). As at September 2018, foreign public debt of Zimbabwe amounted to US$7.7 billion, dominated by penalties at US$5.9 billion (African Development Bank, 2018; MOF, 2018). The share of domestic public debt in total public debt, however, decreased incrementally after 2005 due to escalating inflation, which eroded the monetary value of all government securities and bank balances (Gono, 2008).

The noticeable sudden rise in domestic public debt in 2016 as displayed in Figure 2 is associated with: (i) the assumption of the central bank debt of US$1.35 billion by the government through the Reserve Bank Debt Assumption Act of July 2015; and (ii) increased issuance of government securities (IMF, 2017b; MOF, 2018). Of the US$2.1 billion worth of government securities issued in 2016, only US$356.3 million (representing 17%) was used to finance the budget deficit while the remaining US$1.7 billion (representing 83%) was channelled towards repayment of outstanding debts, mostly to the IMF (MOF, 2018). The

increased domestic borrowing by the government exacerbated liquidity shortages in the country's economy between 2014 and 2017 (IMF, 2017a).

3. Review of Related Literature

Throughout economic history, the debate on the correlation between public debt accumulation and economic growth has not provided conclusive results. Overall, economic theory on the relationship between these two variables can be divided broadly into two categories – those that disregard any association between public debt and economic growth (see Kourtellos *et al.*, 2013; Schclarek, 2004; Barro, 1974; 1989) and those that support the existence of correlation between public debt and economic growth. In the former case, public spending, taxes and public debt (both domestic and foreign) have equivalent effects on the economy – the Ricardian Equivalence Hypothesis (Barro, 1974). In the latter scenario, the impact of public debt accumulation on economic growth has been hotly contested and three views emerged.

First, is the supposition that public debt and economic growth are negatively correlated (see, among others, Huang *et al.,* 2018; Gómez-Puig and Sosvilla-Rivero; 2018; Baldacci and Kumar, 2010; Cochrane, 2011). Second, is the perception that points to a positive relation between government borrowing and economic growth (see, among others, Kobayashi, 2015; Balcilar, 2012; DeLong and Summers, 2012). Last, is the presumed nonlinearity relationship between public debt and economic growth (see, among others, Chudik *et al.,* 2016; 2017; Dogan and Bilgili, 2014; Afonso and Jalles, 2013; Minea and Parent, 2012).

Despite lack of an overall consensus on the relationship between public debt and economic growth, most studies support a negative relationship. The major theoretical arguments for a negative association between the two macroeconomic variables are the crowding-out effect of private investment by government debt (see Boccia, 2013; Cochrane, 2001; Barro, 1995; Modigliani, 1961); and the future business uncertainties brought about by inflation (mostly through monetarization of government debt) and tax increase expectations (see Baldacci and Kumar, 2010; Gale and Orzag, 2003). Thus, uncertainty about public policies and eventualities can dampen capital inflows while intensifying capital flight and thus, negatively affecting economic growth (see Alesina and Tabellini, 1989).

High levels of public debt are also believed to restrain economic growth through constraining the scope for countercyclical fiscal policies (see Woo, 2009; Aghion and Kharroubi, 2007).

This negative impact of public debt on economic growth argument is supported empirically by studies such as Huang *et al.* (2018), Gómez-Puig and Sosvilla-Rivero (2018), Ncanywa and Masoga (2018), Qudah (2016), Bonga *et al.*, (2015), among others.

Still there is the postulation that accentuates the positive role of government borrowing to achieve optimal investment demand and invigorate economic growth (see Thirlwall, 1978). The empirical evidence on this hypothesis is found in studies by Nantwi and Erickson (2016), Kobayashi (2015), Balcilar (2012), and DeLong and Summers (2012).

Another divergent notion on the debt-growth nexus theorises that the link between these variables varies considerably with the level of debt. Theoretically, this notion has its foundations in the conventional view, which states that debt can stimulate aggregate demand and output in the short run but crowds-out capital, and hence reduces output, in the long run (see, among others, Elmendorf and Mankiw, 1999; Sachs, 1989; Krugman, 1988). Among the empirical studies that support the debt-growth Laffer-curve are Chudik *et al.* (2016; 2017), Dogan and Bilgili (2014), and Reinhart *et al.* (2012).

The effect of public debt on economic growth may also vary depending on whether it is domestic or foreign. With domestic public debt, it is tentatively feasible for governments to influence the value of debt through altering interest rates and monetarization. In contrast, governments have no control over foreign currency- denominated debt: failure to settle these may have profound consequences on a country's international relations and overall long-run economic growth path (Chudik *et al.,* 2018). Thus, the link between public debt and economic growth is hinged on the government's ability to conduct countercyclical policies – which basically is dependent more on the structure of public debt than on the level of public debt (Ncanywa and Masoga, 2018; Hausmann and Panizza, 2011; De Grauwe, 2011). The implication, therefore, is that countries with diverse government debt structures and monetary arrangements are likely to have varying economic growth rates at any given point in time (see also Hausmann and Panizza, 2013).

The empirical studies that have analysed the impact of government foreign borrowing on economic growth have focused primarily on developing countries (see, among others, Zaman and Arslan, 2014; Ahmed, 2012; Ndikumana and Boyce, 2012; Pattillo *et al.*, 2002; 2004; 2011; Clements *et al*., 2003; Chowdhury, 2001). Contrarily, only a limited number of empirical

studies have been undertaken in emerging and developed countries on the link between foreign public debt and economic growth (see, among others, Soydan and Bedir, 2015).

The empirical studies that have focused on domestic public debt in developing countries have been limited, partly due to the absence of an extensive database on domestic public debt and the historical over-reliance on foreign borrowing (Bua *et al.,* 2014). Of late, however, the number of studies that have examined the impact of domestic public debt on economic growth in developing countries has increased and is not limited to the work of Bua *et al.* (2014), Presbitero (2012), Bacchiocchi and Missale (2012), Arnone and Presbitero (2010), Abbas (2005) and Christensen (2005). Studies that have analysed the effect of domestic public borrowing in emerging economies comprises Mehrotra *et al.* (2012), Calvo (2005), Mehl and Reynaud (2005), Eichengreen *et al*. (2004), and Hausmann (2003).

Finally, there is yet another group of economists who argue that the impact of public debt on economic growth is influenced by existing fiscal institutions. According to Agim (2014), the escalation of public debt and its negative impact on economic growth is because of weak economic institutions. The result is debt distress arising from poor economic policies – eventually making economies highly susceptible to external shocks (Yasemin, 2017; Makin, 2015). Among the studies that have tested this hypothesis are Ferraz and Duarte (2015) and Megersa and Cassimon (2015).

The review of empirical literature on the public debt and economic growth nexus has revealed that the impact of public debt – whether aggregated or disaggregated – on economic growth across various economies has been mixed and inconclusive. However, in the main, there is overwhelming evidence of the negative impact of aggregated and disaggregated public debt on economic growth, on the one hand. Regarding disaggregated public debt, foreign public debt enjoyed more coverage than its domestic counterpart as evidenced by more studies on the impact of foreign debt than on the impact of domestic public debt on economic growth. Despite this imbalance, the empirical evidence is still inclined towards the relatively higher (negative) impact of domestic than that of foreign public debt on economic growth.

4. Empirical Model Specification, Estimation Techniques and Data Description

In this paper, two models have been used to examine the impact of public debt on economic growth. In the first model, the impact of public debt on economic growth and six other control variables was tested (Model 1), while in the second model, the relative impact of domestic and foreign public debt on economic growth, and six other control variables, was examined (Model 2). The study utilises the autoregressive distributed lag (ARDL) model to estimate the underlying relationships in Models 1 and 2 (Pesaran and Shin, 1999; Pesaran *et al.*, 2001). The ARDL approach was chosen because it captures the short- and long-run relationships simultaneously and gives valid and consistent t-statistics (see among others, Makuyana and Odhiambo, 2018; Chirwa and Odhiambo, 2017). The ARDL representation of the empirical Models 1 and 2, and the associated error correction models (ECM), can be expressed as follows:

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

$$\Delta y_t = \phi_0 + \sum_{i=1}^{n} \phi_{1i} \Delta y_{t-i} + \sum_{i=0}^{n} \phi_{2i} \Delta PD_{t-i} + \sum_{i=0}^{n} \phi_{3i} \Delta INV_{t-i} + \sum_{i=0}^{n} \phi_{4i} \Delta LBR_{t-i}$$

$$+ \sum_{i=0}^{n} \phi_{5i} \Delta FB_{t-i} + \sum_{i=0}^{n} \phi_{6i} \Delta TOP_{t-i} + \sum_{i=0}^{n} \phi_{7i} \Delta SAV_{t-i} + \sum_{i=0}^{n} \phi_{8i} \Delta TOT_{t-i}$$

$$+ \sigma_1 y_{t-1} + \sigma_2 PD_{t-1} + \sigma_3 INV_{t-1} + \sigma_4 LBR_{t-1} + \sigma_5 FB_{t-1} + \sigma_6 TOP_{t-1}$$

$$+ \sigma_7 SAV_{t-1} + \sigma_8 TOT_{t-1} + \mu_{1t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where y, the dependent variable, is the annual growth rate of real GDP per-capita (a proxy for economic progress); PD is public debt as a ratio of GDP (a proxy for public debt); INV is gross fixed capital formation as ratio of GDP (a proxy for investment); LBR is the ratio of economically active population aged between 15 and 64 years to total working age population (a proxy for labour); FB is fiscal balance as a ratio of GDP (a proxy for fiscal balance); TOP is the sum of exports and imports as ratio of GDP (a proxy for trade openness); SAV is gross domestic savings as ratio of GDP (a proxy for gross domestic savings); TOT is trade balance

as a ratio of GDP (a proxy for terms of trade); Φ_0 *is a constant;* $\Phi_1 - \Phi_8$ *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;* t *is time period.*

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

Based on Equation 1, the ECM expression is as follows:

$$\Delta y_t = \phi_0 + \sum_{i=1}^{n} \phi_{1i} \Delta y_{t-i} + \sum_{i=0}^{n} \phi_{2i} \Delta PD_{t-i} + \sum_{i=0}^{n} \phi_{3i} \Delta INV_{t-i} + \sum_{i=0}^{n} \phi_{4i} \Delta LBR_{t-i}$$

$$+ \sum_{i=0}^{n} \phi_{5i} \Delta FB_{t-i} + \sum_{i=0}^{n} \phi_{6i} \Delta TOP_{t-i} + \sum_{i=0}^{n} \phi_{7i} \Delta SAV_{t-i} + \sum_{i=0}^{n} \phi_{8i} \Delta TOT_{t-i}$$

$$+ \psi_1 ECM_{t-1} + \mu_{2t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where Φ_0 *is a constant;* $\Phi_1 - \Phi_8$ *and* Ψ_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;* t *is time period; and all the other variables are as described in Equation 1.*

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

The empirical model used in this study was adopted from a hybrid model of Akram (2015), Yakita (2008) and Adams and Bevan (2005) and is specified as follows:

$$\Delta y_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta y_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta DPD_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta FPD_{t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta INV_{t-i}$$

$$+ \sum_{i=0}^{n} \beta_{5i} \Delta LBR_{t-i} + \sum_{i=0}^{n} \beta_{6i} \Delta FB_{t-i} + \sum_{i=0}^{n} \beta_{7i} \Delta TOP_{t-i} + \sum_{i=0}^{n} \beta_{8i} \Delta SAV_{t-i}$$

$$+ \sum_{i=0}^{n} \beta_{9i} \Delta TOT_{t-i} + \rho_1 y_{t-1} + \rho_2 DPD_{t-1} + \rho_3 FPD_{t-1} + \rho_4 INV_{t-1}$$

$$+ \rho_5 LBR_{t-1} + \rho_6 FB_{t-1} + \rho_7 TOP_{t-1} + \rho_8 SAV_{t-1} + \rho_9 TOT_{t-1} + \mu_{3t}$$

$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

where DPD is domestic public debt as a ratio of GDP (a proxy for domestic public debt); FPD is foreign public debt as a ratio of GDP (a proxy for foreign public debt); β_0 *is a constant;* $\beta_1 - \beta_8$ *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;* t *is time period; and all the other variables are as described in Equation 1.*

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

Based on Equation 3, the ECM expression is as follows:

$$\Delta y_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta y_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta DPD_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta FPD_{t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta INV_{t-i}$$
$$+ \sum_{i=0}^{n} \beta_{5i} \Delta LBR_{t-i} + \sum_{i=0}^{n} \beta_{6i} \Delta FB_{t-i} + \sum_{i=0}^{n} \beta_{7i} \Delta TOP_{t-i} + \sum_{i=0}^{n} \beta_{8i} \Delta SAV_{t-i}$$
$$+ \sum_{i=0}^{n} \lambda_{9i} \Delta TOT_{t-i} + \psi_2 ECM_{t-1} + \mu_{4t} \dots\dots\dots\dots\dots\dots (4)$$

where β_0 *is a constant;* $\beta_1 - \beta_8$ *and* ψ_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;* t *is time period; and all the other variables are as described in Equation 3.*

Should there be a shock in the economy, the ECM term in Equations (2) and (4) measures the short-run speed of adjustment back to the steady-state path of the estimated ARDL model (Chirwa and Odhiambo, 2017: 281). Accordingly, the coefficient of the error correction term, in both models, is expected to be negative and statistically significant, lying between -1 and 1.

The study uses annual time-series data for the period from 1970 to 2017. The data for all the variables in Model 1 and Model 2 was obtained from the World Bank Development Indicators, 1970-2017 (World Bank, 2018), except for domestic public debt which was obtained from the Reserve Bank of Zimbabwe Annual Reports (RBZ, 2018b).

5. Empirical Results and Analysis

5.1. Stationarity and Cointegration Test Results

The empirical analysis begins by testing for stationarity of all regression variables in Models 1 and 2 in order to establish the order of integration, which should not be more than one. The stationarity tests were performed using the Dickey-Fuller Generalised Least Square (DF-GLS) and the Phillips-Perron (PP) techniques. The results of the stationarity tests are presented in Tables 1 and 2.

Table 1: Stationarity Test Results – All Variables [Models 1 and 2]: DF-GLS Test

Variable	Stationarity of all variables in levels		Stationarity of all variables in first difference	
	Without trend	With trend	Without trend	With trend
y	-3.295***	-6.219***	-	-
PD	-1.890*	-2.616	-	-6.131***
DPD	-0.357	-1.402	-6.029***	-6.620***
FPD	-1.318	-1.383	-5.424***	-5.538***
INV	-1.078	-1.394	-6.476***	-6.771***
LBR	-1.615	-2.039	-1.866*	-2.900*
FB	-3.267***	-5.167***	-	-
TOP	-2.045**	-2.874	-	-6.307***
SAV	-1.538	-1.982	-5.953***	-7.935***
TOT	-1.513	-3.263**	-4.570***	-

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

Table 2: Stationarity Test Results – All Variables [Models 1 and 2]: PP Test

Variable	Stationarity of all variables in levels		Stationarity of all variables in first difference	
	Without trend	With trend	Without trend	With trend
y	-5.592***	-6.116***	-	-
PD	-1.857	-2.689	-7.378***	-7.442***
DPD	-1.096	-1.367	-6.748***	-6.711***
FPD	-1.521	-1.451	-5.239***	-5.860***
INV	-1.065	-1.436	-6.576***	-6.819***
LBR	-1.702	-0.164	-5.930***	-7.617***
FB	-3.302**	-5.204***	-	-
TOP	-2.888**	-2.999	-	-10.254***
SAV	-2.714*	-2.862	-	-10.161***
TOT	-3.532**	-3.272*	-	-

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

The stationarity results reported in Tables 1 and 2 show that all the variables are either integrated of order zero or one. This infers that the ARDL approach is applicable in the two models. The study, therefore, proceeds to test for cointegration and the results of the bounds F-statistic test are presented 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, INV, LBR, FB, TOP, SAV, TOT)	5.291***	Cointegrated
2	y	F(y| DPD, FPD, INV, LBR, FB, TOP, SAV, TOT)	3.631**	Cointegrated

Asymptotic critical values (unrestricted intercept and no trend)						
Pesaran *et al.* (2001: 300) critical values	**1%**		**5%**		**10%**	
	I(0)	*I(1)*	*I(0)*	*I(1)*	*I(0)*	*I(1)*
[Table CI(iii) Case III]: Model 1	2.96	4.26	2.32	3.50	2.03	3.13

[Table CI(iii) Case III]: Model 2	2.79	4.10	2.22	3.39	1.95	3.06

*Note: ** and *** denote statistical significance at 5% and 1%, respectively.*

The cointegration results reported in Table 3 indicate that the calculated F-statistic values are all greater than the respective upper bound Pesaran *et al*. (2001: 300) critical values of 4.26 and 4.10 at 1% and 5% significance level, respectively. This signifies the presence of a long-run association between economic growth and the set of independent variables in each model. The study, therefore, proceeds to estimate the short-run and long-run coefficients of Models 1 and 2.

5.2. Empirical Analysis of ARDL Models 1 and 2

The long-run and short-run coefficients for the Zimbabwean public debt-growth Models 1 and 2 are reported in Tables 4 and 5, respectively. Based on the robustness of the results, the study selected BIC-based ARDL (1, 1, 0, 1, 0, 0, 0, 1) for Model 1 and BIC-based ARDL (1, 0, 0, 0, 2, 0, 0, 0, 1) for Model 2. Table 4 displays the estimated long-run coefficients, while Table 5 displays the estimated short-run coefficients, of both models.

Table 4: Long-run Coefficients (Regressand: y)

Regressors	**Model 1** **Coefficient[T-ratio]**	**Model 2** **Coefficient[T-ratio]**
C	-56.458[-2.680] **	-26.927[-1.705] *
PD	-0.203[-1.742] *	-
DPD	-	-0.309[-3.121] ***
FPD	-	-0.285[-4.702] ***
INV	0.477[2.227] **	0.138[0.622]
LBR	0.579[1.997] *	0.459[1.909] *
FB	-0.007[-1.845] *	-0.096[-2.153] **
TOP	0.160[1.285]	0.163[1.504]
SAV	0.245[1.193]	0.187[0.996]
TOT	-0.652[-2.367] **	-0.214[-0.890]

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

Table 5: Short-run Coefficients (Regressand: Δy)

Regressors	Model 1 Coefficient[T-ratio]	Model 2 Coefficient[T-ratio]
ΔPD	-0.596[-4.669] ***	-
ΔDPD	-	-0.296[-3.504] ***
ΔFPD	-	-0.274[-4.564] ***
ΔINV	0.439[1.966] *	0.132[0.612]
ΔLBR	-0.526[-0.758]	0.880[1.287]
ΔLBR(1)	-	0.387[1.873] *
ΔFB	-0.006[-3.966] ***	-0.092[-1.978] *
ΔTOP	0.147[1.223]	0.156[1.469]
ΔSAV	0.225[1.277]	0.180[1.030]
ΔTOT	0.075[0.255]	0.564[2.007] *
ECM(-1)	-0.519[-6.471] ***	-0.860[-7.470] ***
	Model 1	**Model 2**
R-squared	0.750	0.791
R-bar-squared	0.634	0.676
F-statistic	5.575	5.981
Prob[F-statistic]	0.000	0.000
DW statistic	2.174	1.969

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

The long-run regression results for Model 1 [Table 4] show that the coefficient of public debt (PD) is negative and is statistically significant at 10%, implying that an increase in public debt in Zimbabwe leads to a decrease in economic growth (y), in the long run. This finding suggests that the high levels of public debt in this country have been harming the economy through, among other reasons, credit rationing and high domestic interest rates, which crowded-out

private sector investment (see RBZ, 2014: 40; MOF, 2018; IMF, 2018b). Also, the high stocks of government debt in this country might have led to subdued entrepreneurial activities due to greater economic uncertainties, arising especially from unpredictable fiscal and monetary policy interventions (IMF, 2014; 2018b). This study result is not unique to Zimbabwe, but a great number of other past studies have shown evidence of negative correlation between public debt and economic growth (see Gómez-Puig, and Sosvilla-Rivero, 2018; Huang *et al.,* 2018; Woo and Kumar, 2015).

The long-run results of other variables in Model 1 indicate that the coefficients of investment (INV) and labour (LBR) are, as expected, positive and statistically significant. However, the coefficients of fiscal balance (FB) and terms of trade (TOT) are found to be negative and statistically significant, implying that an increase in any of these two depresses economic growth in Zimbabwe, in the long run. The financing of fiscal deficits, predominantly through public borrowing and money printing in Zimbabwe, resulted in untamed rise in domestic interest rates and numerous revisions of tax policies, which discouraged long-term private sector investments (IMF, 2014). Moreover, the coefficients of trade openness (TOP) and savings (SAV) were found to be statistically insignificant.

The short-run results for Model 1 are displayed in Table 5. Similar to the long-run results, the short-run dynamics reveal that the coefficient of public debt ($^{\Delta}$PD) is negatively correlated with the economic growth process in Zimbabwe. The results entail that an increase in public debt in Zimbabwe results in a reduction in economic growth rate in the short run. Although unexpected in this study, the result is consistent with the finding in Gómez-Puig and Sosvilla-Rivero (2018).

The short-run results of other variables reveal that the coefficient of investment ($^{\Delta}$INV) is positive and statistically significant, while the coefficient of fiscal balance ($^{\Delta}$FB) is negative and statistically significant. These results imply that while an increase in domestic investment leads to an increase in economic growth, an increase in fiscal balance leads to reduced economic growth in Zimbabwe, in the short run. This finding suggests, therefore, that either the central government expenditures are not being used in high-return productive activities, or the revenue base of the country is narrow – prompting the government to borrow excessively both internally and externally. Finally, the results from other variables show that the

coefficients of labour (ΔLBR), trade openness (ΔTOP), savings (ΔSAV), and terms of trade (ΔTOT) are statistically insignificant.

The overall implication of this study's results is the urgent need for fiscal consolidation in Zimbabwe in order to restore and improve investor surety and prospects about the future progression of the Zimbabwean economy. Fiscal consolidation may entail the undertaking of stringent austerity measures, particularly on government expenditures to curtail persistent fiscal deficits (see Reinhart and Rogoff, 2010).

Similarly, in Table 4, the long-run results for Model 2 show that the impact of public debt on economic growth in Zimbabwe is negative and statistically significant, irrespective of the type of debt, that is, whether it is domestic or foreign public debt. The coefficients of domestic public debt (DPD) and foreign public debt (FPD) are both negative and are statistically significant at 1% significance level. The results suggest that a rise in domestic or foreign public debt leads to a decrease in the economic growth rate in Zimbabwe, in the long run. Also, the results reveal that domestic public debt is more harmful to the Zimbabwean economy in the long run than its foreign counterpart, as revealed by the magnitude of the coefficients of domestic public debt (DPD) and foreign public debt (FPD). The finding is supported by Blanchard (2007), who argues that public sector borrowing from the domestic capital markets increases interest rates and crowds-out private credit, thus stifling economic growth.

According to Hauner (2006), the possession of government securities by commercial banks is associated with lower financial system efficiency and excessive crowding-out than when government debt is held by the non-banking sector (see also Gulde *et al.*, 2006; Christensen, 2004). Thus, apart from deterrent interest rates, the domestic debt- holder composition in Zimbabwe, which is largely composed of commercial banks, may also be contributing to the economic sluggishness in this country (see MOF, 2018).

The long-run negative impact of foreign public debt on economic growth in Zimbabwe may be through subdued entrepreneurship activities arising from constricted international lines of credit and public policy uncertainty (IMF, 2017a). Zimbabwe has a large proportion of foreign public debt and was expelled from concessionary borrowing by most creditors due to non-payment of its arrears (MOF, 2018; IMF, 2009). Consequently, most foreign suppliers of industrial inputs to Zimbabwe demand to be paid in full or in advance, perhaps due to high economic and financial uncertainties in this country – such as repeated currency reforms, high

exchange rate risks and perpetual political crises. The implication is high cost of doing business and reduced economic activity (MOF, 2010b; 2016; 2018). Though contrary to the study expectations, this outcome is consistent with other previous empirical studies on the subject (see Checherita-Westphal and Rother, 2010; Pattillo *et al.*, 2004; Clements *et al.*, 2003; Cohen, 1999; Warner, 1992).

The long-run results of other variables in Model 2 [Table 4] show that the coefficient of labour (LBR) and fiscal balance (FB) are positively and negatively related to economic growth, respectively, in the long run. Thus, the results entail that fiscal deficits lead to economic decline, while labour positively affects economic growth in Zimbabwe, in the long run. Unpredictably, investment (INV), trade openness (TOP), savings (SAV) and terms of trade (TOT) are found to be statistically insignificant in Model 2.

The short-run results of Model 2 [Table 5] show that the coefficients of domestic public debt ($^{\Delta}$DPD) and foreign public debt ($^{\Delta}$FPD) are negative and statistically significant, implying that domestic and foreign public debt in the current period all have a negative impact on economic growth rate in the short run. The results imply that both domestic and foreign public debts in Zimbabwe are adversely affecting total factor productivity, though with different magnitudes, and are forcing up sovereign nominal and real interest rates, resulting in depressed economic growth rates – in the short run.

Given that the short-run coefficient of domestic public debt (-0.296) is larger than that of foreign public debt (-0.274), as with long-run results, the short-run results reveal that domestic public debt has a relatively more deleterious impact on the Zimbabwean economy than its foreign counterpart. This finding suggests that domestic credit markets in Zimbabwe are still narrow, so that government borrowing crowds-out private investment through credit rationing and high cost of capital, leading to depressed capital build-up in this country (see Mankiw, 2000; Modigliani, 1961).

Other Model 2 short-run results show that labour ($^{\Delta}$LBR(1)) and terms of trade ($^{\Delta}$TOT) are positively associated with economic growth in the short run. This suggests that an increase in labour in the past period or an increase in terms of trade in the current period results in an increase in economic growth in Zimbabwe – in the short run. However, investment ($^{\Delta}$INV), labour ($^{\Delta}$LBR), fiscal balance ($^{\Delta}$FB), trade openness ($^{\Delta}$TOP) and savings ($^{\Delta}$SAV) were found to be statistically insignificant.

Finally, as anticipated, the ECM(-1) terms for Models 1 and 2 are all negative and statistically significant at 1%, which verifies the presence of the long-run correlation of all variables in each of the models.

In conclusion, the empirical results presented in this paper show that public debt, whether domestic or foreign, has a negative impact on economic growth in Zimbabwe. The negative impact that public debt has on economic growth can be associated with the crowding-out effect on investment brought about by high cost of capital and credit rationing.

To check on robustness of the study's results in the two empirical models, four diagnostic tests were performed and the results are displayed in Table 6.

Table 6: ECM-ARDL Diagnostic Test Results – Models 1 and 2

	LM test statistic			
Results [Probability]	*Serial Correlation: CHSQ (1)*	*Functional Form: CHSQ (1)*	*Normality: CHSQ (2)*	*Heteroscedasticity: CHSQ (1)*
Model 1	0.854 [0.356]	3.036* [0.081]	0.687 [0.709]	0.350 [0.554]
Model 2	0.379 [0.495]	0.132 [0.716]	2.350 [0.309]	0.009 [0.922]

*Note: * denotes statistical significance at 10% level.*

Whereas the diagnostic test results in Table 6 indicate that Model 2 passes all the diagnostic tests, Model 1 fails on the functional form. Therefore, to check for model stability, the study plotted the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ) and the results are displayed in Figure 3 and Figure 4.

Figure 3: Model 1

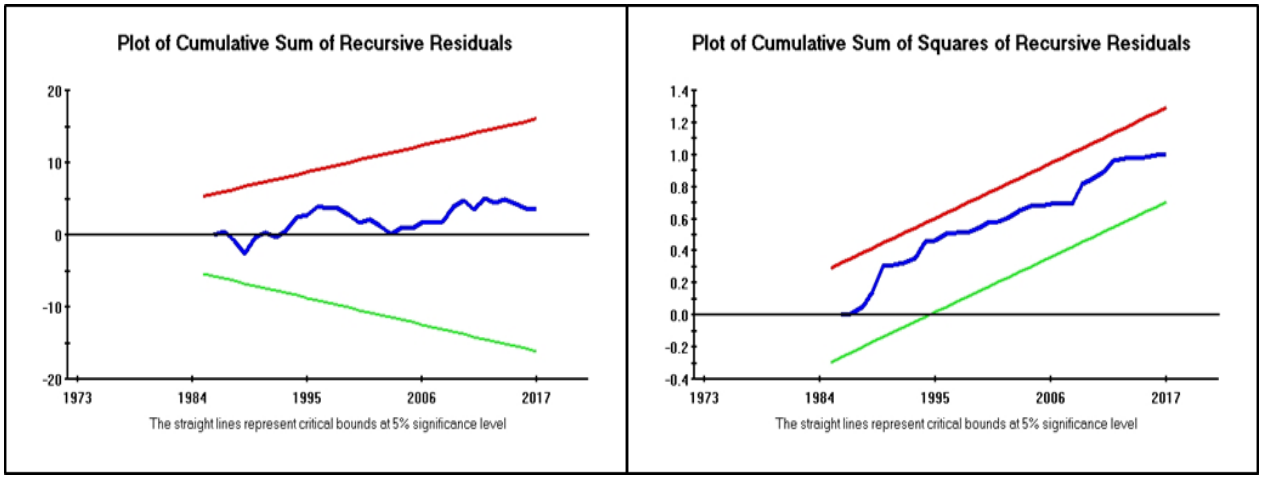
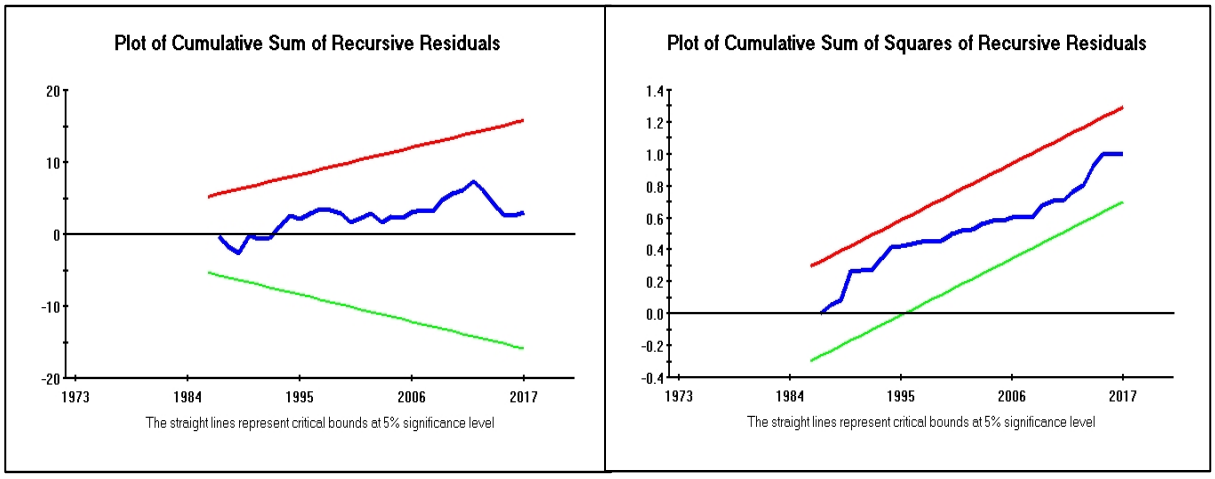


Figure 4: Model 2



As shown in Figures 3 and 4, all the models pass the stability test as revealed by CUSUM and CUSUMSQ plots which are within the boundaries at 5% significance level, signifying that the estimated results are consistently reliable.

6. Concluding Remarks and Policy Implications

In the wake of rapidly increasing public debt in Zimbabwe, arising from both the global and domestic economic and financial crises, there have been solemn concerns about the impact of public debt on economic growth. However, despite this massive accumulation in public debt, Zimbabwe does not have much coverage on the public debt-economic growth studies. Public debt, in particular, is largely known in literature for discouraging meaningful investments and therefore reducing economic growth. The transmission from public debt to lower economic

growth rates is mostly through higher interest rates, credit rationing, higher and uncertain future distortionary taxes and higher levels of inflation.

The growth in public debt in Zimbabwe has largely been driven by perpetual fiscal imbalances, while the printing of money to cover these fiscal gaps exacerbated the adverse economic and financial situation in this country. This paper has, therefore, provided empirical evidence on the impact of public debt on economic growth in Zimbabwe over the period from 1970 to 2017. In the paper, the relative impact of domestic and foreign public debt on economic growth has also been investigated. The paper used the ARDL approach to undertake all the regression analysis.

The empirical findings of this study reveal that the impact of public debt on economic growth in Zimbabwe is negative, irrespective of whether public debt is aggregated or disaggregated, and irrespective of the type of debt – domestic or foreign. More so, the results reveal that domestic public debt is more disastrous to the Zimbabwean economy than its foreign counterpart. These study findings are found to apply regardless of whether the regression analysis is undertaken in the short or the long run. The implication of these results is that heavy reliance on public debt – domestic or foreign – should be strongly discouraged in Zimbabwe. The analysis concludes that public debt is a key negative determinant of economic growth in Zimbabwe and therefore recommends public finance and public debt management reforms that reduces public debt burden to sustainable levels and that enhances macroeconomic stability.

The suggested reforms in this study therefore include the crafting of a public expenditure framework to reduce primary deficit. This comprises controlling and monitoring public expenditures through a properly constituted legal framework, as well as trimming the size of the government. The government is also encouraged to channel borrowed funds and tax revenues to productive areas with high returns. There is also need to set up a clear legal framework that guides the issuance of treasury bills in Zimbabwe, including rescinding of the government overdraft facility with the central bank. The government of Zimbabwe should also consider selling its debt securities to the general public rather than to commercial banks. This initiative will leave the central bank as a regulatory institution and also helps to deepen the domestic capital markets in Zimbabwe.

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