UNISA ECONOMIC RESEARCH
WORKING PAPER SERIES

RELATIVE IMPACT OF DOMESTIC AND FOREIGN PUBLIC DEBT ON ECONOMIC GROWTH IN SOUTH AFRICA

Talknice Saungweme
Nicholas M. Odhiambo

Working Paper 21/2019
August 2019

Talknice Saungweme
Department of Economics
University of South Africa
P. O. Box 392, UNISA
0003, Pretoria
South Africa
Email: talknice2009@gmail.com

Nicholas M. Odhiambo
Department of Economics
University of South Africa
P. O. Box 392, UNISA
0003, Pretoria
South Africa
Email: odhianm@unisa.ac.za / nmbaya99@yahoo.com

RELATIVE IMPACT OF DOMESTIC AND FOREIGN PUBLIC DEBT ON ECONOMIC GROWTH IN SOUTH AFRICA

Talknice Saungweme[1] and Nicholas M. Odhiambo

Abstract

This paper investigates the nexus between public debt and economic growth by testing both the impact of aggregate public debt on economic growth, as well as the relative impact of domestic and foreign public debt on economic growth in South Africa – during the period from 1970 to 2017. The study utilises the autoregressive distributed lag (ARDL) technique to explain the underlying relationship between public debt (domestic and foreign) and economic growth. The empirical evidence from the study reveals that the impact of aggregated public debt on economic growth in South Africa is negative, both in the short run and in the long run. The results further reveal that the impact of disaggregated public debt on economic growth varies depending on the type of government debt and the time frame considered. Whereas domestic public debt is positively related to economic growth in the short run, the relationship is insignificant in the long run. Contrary, foreign public debt in South Africa is negatively associated with economic growth in the long run but is insignificant in the short run. In line with the empirical evidence, the study recommends that appropriate domestic public debt policies be pursued in South Africa, in order to improve economic growth. However, the study cautions the country against growing foreign public debt as this was found to have devastating economic growth consequences in the long run.

Keywords: Public debt, domestic public debt, foreign public debt, economic growth, South Africa, ARDL

JEL Classification : H62, H63, O47

[1] Corresponding author: Talknice Saungweme, Department of Economics, University of South Africa (UNISA). Email address: talknice2009@gmail.com.

1. Introduction

In literature, public debt can be growth-enhancing when it is confined to productive activities that help in diversifying the economy and in expanding the export structures (see, for example, Spilioti and Vamvoukas, 2015; Kobayashi, 2015; Balcilar, 2012; DeLong and Summers, 2012). On the negative side, public debt may indirectly dampen the level of economic growth by discouraging physical capital formation, and encouraging capital flight due to public policies uncertainties, especially with regard to tax increases (Levy and Chowdhury, 1993; Modigliani, 1961). The crowding out effect of public debt on private investment is worse in the presence of a narrow national revenue base (Boccia, 2013; Alesina and Tabellini, 1989).

Although existing empirical literature generally supports the crowding out effect of public debt on economic growth (see, Huang *et al*., 2018; Gómez-Puig and Sosvilla-Rivero; 2018; Baldacci and Kumar, 2010; among others), it is still open to debate over which type of public debt – domestic or foreign – is more important or more disastrous to economic growth (see, for example, Akram, 2016; 2015; Hausmann and Panizza, 2011; De Grauwe, 2011; Yakita, 2008; Adams and Bevan, 2005). Thus, for policymakers who are anxious with improving economic growth rates, it is not just the level of aggregate public debt that matters, but its composition between the domestic and foreign components.

Unlike other sub-Saharan African countries, the component of domestic public debt in South Africa has been higher than its foreign counterpart since the 1980s (Republic of South Africa "RSA", 1998). The massive institutional and legal public debt management reforms that were implemented by the South African government beginning 1994 further increased the proportion of domestic public debt relative to foreign public debt (see Saungweme and Odhiambo, 2018). Against this background, this paper attempts to empirically explore the macroeconomic impact of aggregate public debt on economic growth, while simultaneously estimating the relative impact of domestic and foreign public debt on economic growth in South Africa from 1970 to 2017 – using the Autoregressive Distributed Lag (ARDL) bounds testing approach.

The contribution of the paper to the public debt-economic growth debate in South Africa is twofold. Firstly, unlike most of the past studies conducted on the subject that focussed mainly on aggregated public debt, this paper examines the impact of both the aggregated and disaggregated public debt on economic growth (see, for example, Mhlaba and Phiri, 2019;

Ncanywa and Masoga, 2018). Thus, the paper jointly examines the overall impact of aggregate public debt on economic growth and further splits public debt into domestic and foreign component and empirically examines their relative impact on economic growth in South Africa. The analysis of the impact of domestic and foreign public debt separately plays a vital role in ensuring financial and macroeconomic stability of the South African economy.

Secondly, unlike most previous studies that bundle countries together, especially in cross-sectional analysis, the paper uses the time-series approach, which caters for country-specific effects often ignored by other studies (see, for example, Gómez-Puig and Sosvilla-Rivero, 2018; Akram, 2016; Egert, 2012; Reinhart and Rogoff, 2010).

The remaining part of the paper is set out as follows: Section 2 covers the past trends in public debt in South Africa from 1970 to 2017. A review of the theoretical and empirical literature follows in Section 3, while the estimation techniques and empirical analysis are outlined in Section 4. Lastly, conclusions and policy implications that emerged from the study are given in Section 5.

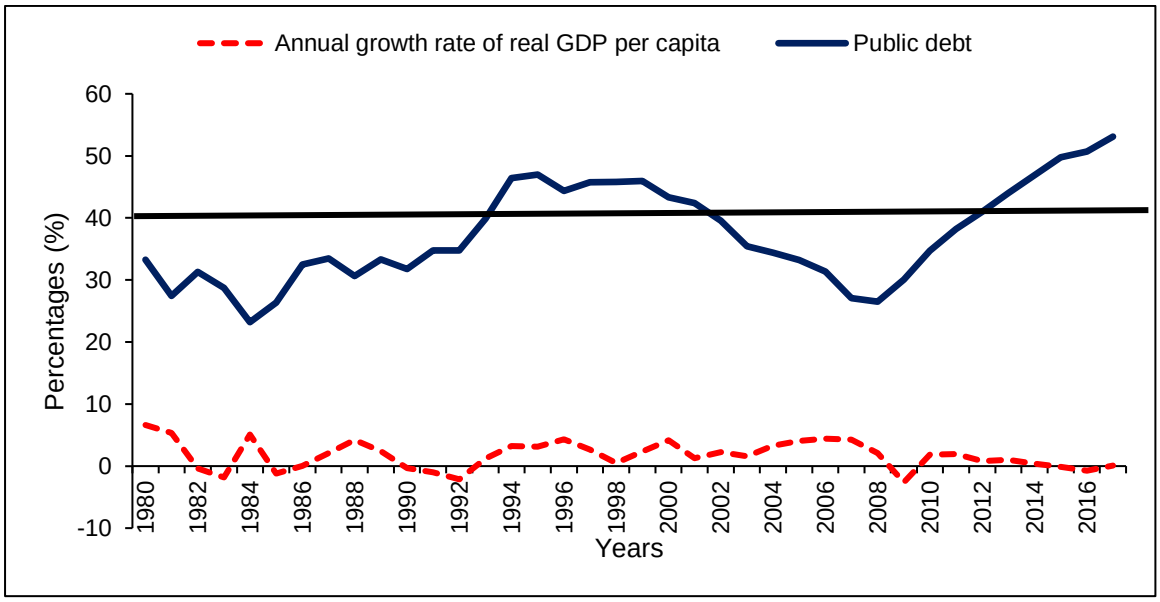
2. A Highlight of the Past Reforms and Trends in Public Debt and Economic Growth in South Africa

South Africa is a newly industrialised country which has undergone a series of economic, political and financial transformations since the 1970s. These restructurings were accompanied by massive institutional and legal public debt management reforms which caused substantial changes in public debt structure and composition (Nattrass and Ardington, 1990; South African Reserve Bank "SARB", 2018). The institutional reforms included the formation of numerous public finance management institutions, such as the National Treasury, the Bond Exchange of South Africa, and the Fiscal Finance Commission, among others (Mhlaba and Phiri, 2019; Majam, 2017, RSA, 2014). These public sector financial reforms strengthened the development of both primary and secondary debt markets in South Africa. Currently, South Africa's government debt is mostly denominated in local currency, Rands, with a small proportion of the country's domestic debt being held by non-residents (RSA, 2015).

Among the economic growth strategies that were implemented by the South African government since the 1990s are the Reconstruction and Development Programme (RDP) of 1994, the Growth, Employment and Redistribution (GEAR) policy of 1996, the Accelerated

and Shared Growth Initiative for South Africa (ASGISA) of 2005, the New Growth Path Framework of 2010 and the National Development Plan 2030 of 2011 (The Presidency, 2006; RSA, 2010; National Planning Commission, 2011). These economic policies led to the growth in private sector participation in national development and are largely attributed to the positive economic growth rates recorded in South Africa between 1994 and 2014, except in 2009 (World Bank, 2018). Figure 1 presents a summary of public debt and economic growth trends in response to the various financial and economic policies implemented in South Africa between 1980 and 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: Trends in Public Debt and Economic Growth in South Africa (1980 - 2017)

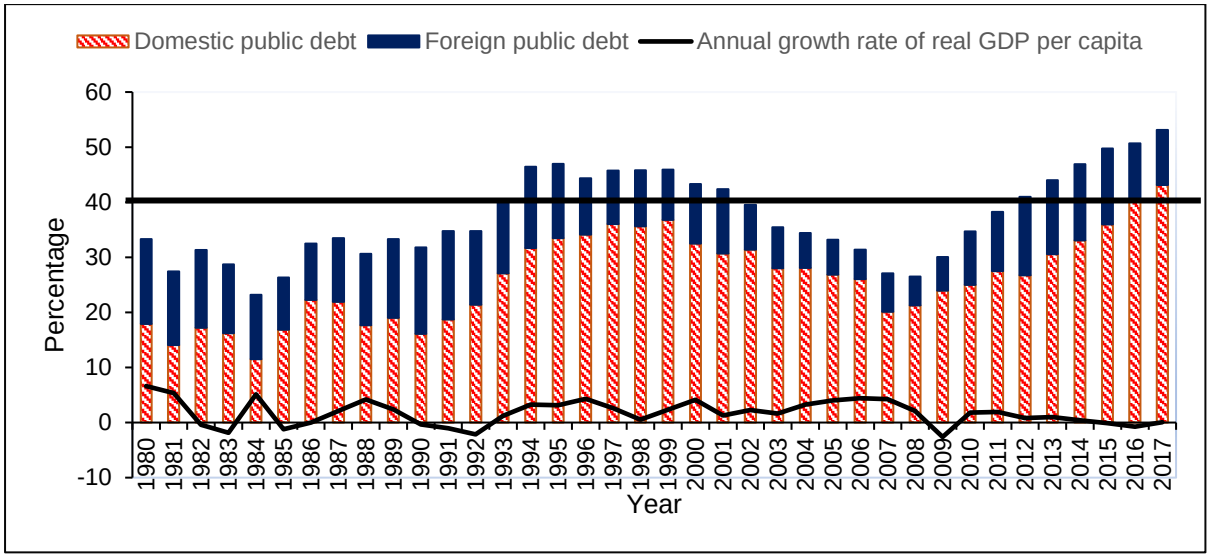


Source: World Bank (2018)

Figure 1 shows three distinct phases in the evolution of public debt in South Africa; that is, 1980 – 1994, 1995 – 2008 and 2009 – 2017. Generally, between 1984 and 1994 public debt/RGDP per capita ratio maintained an upward trajectory, springing mainly from rising fiscal deficits, which reached a period peak of 47% in 1994 (Statistics South Africa, 2017). This was followed by a marked decrease in the public debt/RGDP per capita ratio during the period from 1995 to 2008. As Figure 1 illustrates, between 1993 and 2001, South Africa was in public debt distress, a condition which prompted the country to continue reforming financially and economically. These reforms facilitated the reduction in budget deficits and promoted remarkable economic growth rates, resulting in the downward trend of the public

debt to real GDP ratio displayed in Figure 1; reaching a period low of 25.9% in 2008 (RSA, 2012). Also, during this phase, 1995 – 2008, there was massive industrialisation drive, which helped in the economic diversification of this economy (African Development Bank *et al*., 2017). In the last phase, 2009 – 2017, there is a noticeable upward trend in the public debt/RGDP per capita ratio, which can be attributed to the tail-effects of the 2008 global financial crisis and also to the introduction of new government debt instruments (Statistics South Africa, 2017; RSA, 2011). Figure 2 gives a pictorial view of the composition of public debt between 1980 to 2017, expressed as a ratio of real GDP.

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



Source: SARB (2018)

As portrayed in Figure 2, the government of South Africa has been predominantly relying on the domestic capital markets to finance its budget needs, as domestic public debt constitutes a major part of the total public debt, while the share of foreign public debt in the total public debt has, overall, declined over time. In the period between 1995 and 2001, the decrease in public debt/RGDP per capita ratio was mostly emanating from the government's drive to reduce the foreign debt component and also from the overall growth of the economy, as shown in Figure 2 (World Bank, 2018). The blending of a wide basket of government securities and attractive interest rates has added to the broadening of the country's investor base (RSA, 2016a; 2016b; 2016c). Figure 2 also shows that South Africa breached the International Monetary Fund and the World Bank public debt indicative threshold of 40% between 1993 and 2002, and between 2012 and 2017 – being caused by an exponential growth in domestic public debt that reached 43.1% in 2017 (SARB, 2018).

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

Until now, the theoretical and empirical literature on the impact of public debt on economic growth has been vast, and in some instances, the results have been conflicting. There are four strands of theoretical literature that explain the relationship between the different types of sovereign debt and economic growth.

The first component argues that public debt – domestic and foreign – and economic growth are negatively correlated. This view is supported mainly by the public debt overhang hypothesis (Myers, 1971), and the crowding out effect (Krugman, 1988; Diamond, 1965; Modigliani, 1961). The second strand of literature argues that public debt and economic growth are positively related. This preposition is supported in the literature by the dual gap theory (Krueger, 1987; Chenery and Strout, 1966), the Wagner's hypothesis of "Law of increasing state activity" (Wagner, 1893) and the Keynesians' fiscal multiplier effect (Rebelo, 1995; Arrow and Kuz, 1970).

The third strand of literature disregard any relationship between public debt and economic growth, known in the literature as the Ricardian Equivalence Hypothesis (Barro, 1974). Finally, is another set of theoretical literature purporting that the relationship between public debt and economic growth is nonlinear. This view hypothesises that at low levels, public debt is growth enhancing; however, beyond a certain point, public debt leads to lower and possibly negative economic growth rates (Sachs, 1989).

Empirically, four groups of studies have been identified. Firstly, are those studies that predominantly focussed on the relationship between aggregate public debt and economic growth (see, among others, Huang *et al*., 2018; Gómez-Puig and Sosvilla-Rivero, 2018; Ncanywa and Masoga, 2018; Chudik *et al*., 2017; 2016; Nantwi and Erickson, 2016; Qudah, 2016; Bonga *et al*., 2015; Kobayashi, 2015; Dogan and Bilgili, 2014; Afonso and Jalles, 2013). The findings from these studies varied across studied economies. While some studies found a negative relationship between public debt and economic growth (see Huang *et al*., 2018; Gómez-Puig and Sosvilla-Rivero, 2018; Ewaida, 2017; among others), others found a positive relationship (see, for example, Balcilar, 2012; Greiner, 2011; Abu-Bakar and Hassan, 2008). Yet other studies found either a nonlinear relationship (see Dogan and Bilgili, 2014; Baum *et al*., 2012; Minea and Parent, 2012, among others) or no relationship between public debt and economic growth (see, for instance, Kourtellos *et al*., 2013). The empirical results on the impact

between aggregated public debt and economic growth are, therefore, far from conclusive and vary across model specification, sample estimation method and public debt indicator used.

Secondly, are those studies that tested the impact of foreign public debt on economic growth (see, for example, Soydan and Bedir, 2015; Zaman and Arslan, 2014; Ahmed, 2012; Ndikumana and Boyce, 2012; Pattillo *et al*., 2011; 2004; Clements *et al*., 2003; Chowdhury, 2001). The bulk of these empirical studies provide evidence that supports the view that high levels of foreign public debt retard economic growth (See Salotti and Tcecroci, 2012; Clements *et al*., 2003; among others). However, the results of Romero and Burkey (2011) reveal that low levels of foreign public debt are growth-enhancing.

Thirdly, is yet another strand of empirical studies that examined the impact of domestic public debt on economic growth and the results have been mixed (see, for instance, Bua *et al*., 2014; Mehrotra *et al*., 2012; Presbitero, 2012; Arnone and Presbitero, 2010; among others). According to Gulde *et al*. (2006) and Moss *et al*. (2006), domestic public borrowing stimulates economic growth by deepening money and financial markets, and thus assist in mobilising investment funds.

Lastly, is the strand of empirical literature that explored the relative impact of domestic and foreign public debt on economic growth (see Mohanty and Panda, 2019; Akram, 2015; 2016; Yakita, 2008, and Adams and Bevan, 2005). For instance, the results of Akram (2015) reveal that in the Philippines, foreign public debt is negatively related to economic growth, while domestic public debt positively affects economic growth. Further, using a sample of four countries – Bangladesh, India, Pakistan and Sri Lanka – the results of Akram (2016) show that although aggregate public debt has a negative impact on economic growth, foreign public debt insignificantly affects economic growth, while domestic public debt has a positive impact on economic growth. Contrary, the results of Mohanty and Panda (2019) show that domestic public debt has a more adverse impact on the Indian economy than foreign public debt.

Overall, the review of empirical literature on the relationship between public debt and economic growth has shown that the impact of public debt (domestic and foreign) on economic growth across studied countries has been mixed and inconclusive. On the whole, this study has revealed that: (i) most previous studies focused on the relationship between aggregated public debt and economic growth; (ii) there is overwhelming evidence supporting a negative impact of aggregated and disaggregated public debt on economic growth; (iii) more studies were

conducted on the impact of foreign public debt than on the impact of domestic public debt on economic growth; and (iv) the empirical studies that have tested the relative impact of domestic and foreign public debt on economic growth are scanty and the evidence has been mixed.

4. Methodology, Data Description and Sources, and Empirical Analysis

4.1. Cointegration – Autoregressive Distributed Lag ARDL Bounds Testing Procedure

This study utilises the ARDL bounds testing procedure to test the impact of aggregated and disaggregated public debt on economic growth in South Africa (Pesaran and Shin, 1999; Pesaran *et al.*, 2001). The ARDL model has four major strengths over the residual-based approach by Engle and Granger (1987), and the full maximum likelihood approach by Johansen and Juselius (1990). First, the ARDL approach captures the short- and long-run relationships simultaneously, and the t-statistics from the ARDL procedure are valid, and its long-run estimates are unbiased – even when some of the regressors are endogenous (Pesaran and Shin, 1999; Odhiambo, 2011). Second, the ARDL approach does not impose the restrictive requirement that all the variables under study must be integrated of the same order. Third, the ARDL procedure uses a single reduced-form equation. Lastly, the ARDL is flexible as it allows a general to specific modelling framework by varying the number of lags (Muyambiri and Odhiambo, 2018).

4.2 Data Sources and Description

The study uses annual time-series data, spanning from 1970 to 2017. The data for all the regression variables were obtained from the World Bank Development Indicators (World Bank, 2018); except for domestic public debt which was obtained from the South African Reserve Bank publications and online database (SARB, 2018). Table 1 gives a description of all the regression variables used in the study.

Table 1: Description of Regression Variables

Notation	Variable description
y	Annual growth rate of real GDP per capita (a proxy for economic growth)
PD	Public debt/RGDP ratio (a proxy for public debt)
DPD	Domestic public debt/RGDP ratio (a proxy for domestic public debt)
FPD	Foreign public debt/RGDP ratio (a proxy for foreign public debt)
INV	Gross fixed capital formation/RGDP ratio (a proxy for gross domestic investment)
LBR	Economically active population aged between 15 and 64 years/Total working age population ratio (a proxy for labour)
FB	Fiscal balance/RGDP ratio (a proxy of fiscal balance)
TOP	Trade openness/RGDP ratio (a proxy for trade openness)
SAV	Gross domestic savings/RGDP ratio (a proxy for savings)
TOT	Trade balance/RGDP ratio (a proxy for terms of trade)

4.2 The Impact of Aggregated and Disaggregated Public Debt on Economic Growth

To test the impact of public debt on economic growth, the study applies two models, Model 1 and Model 2. In Model 1, the study explores the impact of aggregate public debt on economic growth, while in Model 2, the relative impact of domestic and foreign public debt on economic growth was examined. Six control variables, that is, investment, labour, fiscal balance, trade openness, savings and terms of trade were added to each of the two models. The ARDL expression of Model 1 is given as:

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

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

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

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

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

Where ϕ_0 *is a constant;* $\phi_1 - \phi_8$ *and* $\sigma_1 - \sigma_8$ *are short-run and long-run regression coefficients, respectively;* Δ *is the difference operator;* n *is the maximum lag length;* μ_{1t} *is the error term; and* t *is the time period. All other variables are as described in Table 1.*

The error correction model based on Model 1 is expressed as follows:

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

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

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

Where ψ_1 *is the coefficient of the* ECM*;* ECM_{t-1} *is the error-correction term lagged by one period;* t *is the 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

To examine the relative impact of domestic and foreign public debt in South Africa, the study applies the modified version of Akram (2016; 2015)'s models, and the ARDL expression of the model (Model 2) is given as:

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

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

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

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

Where DPD is domestic public debt; FPD is foreign public debt; β_0 is a constant; $\beta_1 - \beta_9$ and $\rho_1 - \rho_9$ are short-run and long-run regression coefficients, respectively; Δ is the difference operator; n is the maximum lag length; μ_{3t} is the error term; t is the time period; and all the other variables are as described in Table 1.

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

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

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

$$+ \sum_{i=0}^{n} \lambda_{9i} \Delta TOT_{t-i} + \psi_2 ECM_{t-1} + \mu_{4t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where ψ_2 is the coefficient of the ECM; ECM_{t-1} is the error-correction term lagged by one period; t is the time period; and all the other variables are as described in equation (3).

In the event of a macroeconomic disturbance in the South African economy, the error correction terms in Equations (2) and (4) measure the short-run speed of adjustment towards the steady-state path of the estimated ARDL model (Chirwa and Odhiambo, 2017). Hence, the coefficient of the error correction term, in both equations, is expected to be negative and statistically significant, lying between 0 and 1.

4.3 Empirical Analysis

The study begins by subjecting all regression variables to stationarity tests in order to establish whether the ARDL model is applicable or not. For this purpose, the study employs the Dickey-Fuller Generalised Least Square (DF-GLS) and the Perron, 1997 (PPURoot) unit root testing techniques. Tables 2 and 3 present the results of the stationarity tests.

stationarity tests.

Table 2: 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	-4.928***	-4.946***	-	-
PD	-1.692*	-1.921	-	-5.444***
DPD	-1.008	-2.273	-2.680***	-6.793***
FPD	-1.779	-2.626	-4.203***	-4.573***
INV	-0.815	-1.702	-5.370***	-4.793***
LBR	-1.447	-3.294**	-4.977***	-
FB	-2.648***	-2.794	-	-6.537***
TOP	-1.964**	-2.315	-	-7.251***
SAV	-1.279	-1.765	-4.932***	-5.566***
TOT	-1.665*	-2.618	-	-6.643***

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

Table 3: Stationarity Test Results – All variables [Models 1 and 2]: PPURoot test

Variable	Stationarity of all variables in levels		Stationarity of all variables in first difference	
	Without trend	With trend	Without trend	With trend
y	-5.578**	-5.588**	-	-
PD	-2.319	-2.781	-6.072***	-6.006***
DPD	-3.478	-2.879	-5.470**	-6.157**
FPD	-4.646	-4.488	-5.879**	-5.798**
INV	-3.425	-3.419	-6.346***	-6.423***
LBR	-4.057	-4.306	-6.910***	-8.300***
FB	-3.340	-3.274	-7.596***	-7.253***
TOP	-3.584	-3.754	-7.766***	-7.780***
SAV	-3.310	-3.491	-7.049***	-7.508***
TOT	-4.208	-4.197	-7.286***	-7.941***

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

The stationarity results reported in Tables 2 and 3 indicate that all the variables are integrated of order zero or one, thus validating the applicability of the ARDL approach in the two models. The study proceeds to test for the existence of the long-run relationship of the variables in the two models, Model 1 and Model 2. Table 4 presents the results of the bounds F-test for cointegration.

Table 4: ARDL-bounds Test for Cointegration – Models 1 and 2

Model	**Dependent variable**	**Function**	**F-statistic**	**Cointegration status**
1	y	F(y| PD, INV, LBR, FB, TOP, SAV, TOT)	3.641**	Cointegrated
2	y	F(y| DPD, FPD, INV, LBR, FB, TOP, SAV, TOT)	3.177*	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 * imply statistical significance at 5% and 10%, respectively.*

The results in Table 4 show that the variables in the aggregated and disaggregated public debt-economic growth models are cointegrated. This implies that the null hypothesis of no long-run relationship in the two models is rejected. Hence, the next step is to estimate the long-run coefficients and the associated error correction models.

Based on the robustness of the results, the study selected AIC-based ARDL (3, 3, 1, 3, 3, 1, 3, 3) for Model 1 and AIC-based ARDL (3, 3, 1, 1, 3, 3, 3, 1, 1) for Model 2. Table 5 displays the estimated long-run coefficients of the two models, while Table 6 gives the estimated short-run coefficients of both models – Models 1 and 2.

Table 5: Long-run Coefficients (Regressand: y)

Regressors	Model 1 Coefficient[*T-ratio*]	Model 2 Coefficient[*T-ratio*]
C	86.627** [*2.724*]	62.052** [*2.305*]
PD	-0.301* [*-1.809*]	-
DPD	-	-0.073 [*-1.312*]
FPD	-	-0.094** [*-2.573*]
INV	0.194* [*1.791*]	0.187* [*1.835*]
LBR	-0.294** [*-2.448*]	0.092* [*1.915*]
FB	-0.072** [*-2.613*]	-0.435** [*-2.514*]
TOP	0.160* [*2.064*]	-0.113** [*-2.232*]
SAV	0.177* [*1.988*]	0.290** [*2.384*]
TOT	-0.283 [*-1.593*]	-0.060 [*-0.629*]

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

Table 6: Short-run Coefficients (Regressand: Δy)

Regressors	Model 1 Coefficient[T-ratio]	Model 2 Coefficient[T-ratio]
Δy(1)	0.243* [*1.912*]	0.545** [*2.302*]
Δy(2)	0.264 [*1.377*]	0.226 [*1.342*]
ΔPD	-0.049 [*-0.984*]	-
ΔPD(1)	0.090 [*0.614*]	-
ΔPD(2)	-0.224* [*-1.900*]	-
ΔDPD	-	0.036 [*0.383*]
ΔDPD(1)	-	0.228** [*2.227*]
ΔDPD(2)	-	0.068 [*0.878*]
ΔFPD	-	0.078 [*1.160*]
ΔINV	0.567** [*2.114*]	0.101 [*0.318*]
ΔLBR	-0.183 [*-0.326*]	-0.181 [*-0.303*]
ΔLBR(1)	0.535 [*0.951*]	0.371* [*1.715*]

ΔLBR(2)	0.873 [*1.570*]	0.448 [*1.301*]
ΔFB	0.068 [*0.305*]	-0.424* [*-1.835*]
ΔFB(1)	-0.073*** [*-3.005*]	-0.344 [*-1.325*]
ΔFB(2)	-0.561** [*-2.442*]	-0.381 [*-1.629*]
ΔTOP	-0.091 [*-0.920*]	0.066 [*0.741*]
ΔTOP(1)	-	0.160* [*1.888*]
ΔTOP(2)	-	0.119 [*1.667*]
ΔSAV	0.330 [*1.578*]	0.284 [*1.641*]
ΔSAV(1)	0.318* [*1.803*]	-
ΔSAV(2)	0.419** [*2.565*]	-
ΔTOT	0.138 [*0.773*]	-0.072 [*-0.651*]
ΔTOT(1)	0.364 [*1.460*]	-
ΔTOT(2)	0.052 [*0.338*]	-
ECM(-1)	-0.341*** [*-4.126*]	-0.522*** *[-4.039*]
	Model 1	Model 2
R-squared	0.830	0.869
R-bar-squared	0.559	0.662
F-statistic	3.066	4.185
Prob[F-statistic]	0.010	0.002
DW statistic	2.037	1.831

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

The empirical results for Model 1 show that public debt (PD) has a negative impact on economic growth (y) in the long run, while in the short run the impact varies with the time frame considered. That is, the coefficient of public debt in the current period (ΔPD) is insignificant, implying that public debt has no immediate impact on economic growth (y). However, public debt lagged by two periods (ΔPD(2)) is negatively related to economic growth in the short run. The study findings provide evidence in support of the public debt overhang hypothesis for the South African economy. Although unexpected in this study, this research outcome is consistent with other previous results reported by Mhlaba and Phiri (2019), Huang *et al*. (2018), Gómez-Puig and Sosvilla-Rivero (2018), and Ncanywa and Masoga (2018), among others.

Other results for Model 1 reveal that investment (INV) and savings (SAV) have an expected positive and statistically significant impact on economic growth in South Africa, in the short run and in the long run. This finding is consistent with economic growth theory, such that an

increase in investment or savings leads to increased economic growth in South Africa, both in the short run and long run. The results further reveal economic growth lagged once (Δy(1)) has a positive effect on economic growth in South Africa, in the short run; and that the coefficient of trade openness (TOP) is positive in the long run and insignificant in the short run. Furthermore, the findings of a negative relationship between labour (LBR) and fiscal balance (FB) and economic growth is contradictory to study expectations. Finally, the coefficient of terms of trade (TOT) was found to be statistically insignificant in both the short run and long run.

The long-run results for Model 2 reveal that the general impact of disaggregated public debt on economic growth varies with the type of government debt under consideration and is time-variant. Although the long-run impact of foreign public debt (FPD) is negatively associated with economic growth (y), the impact is insignificant in the short run. However, while the impact of domestic public debt (DPD) on economic growth is statistically insignificant in the long run, domestic public debt lagged once (ΔDPD(1)) is positively related to the economic growth process in South Africa, in the short run. The outcome of this study supports the empirical evidence reported by other researchers such as Akram (2015). However, with regards to foreign public debt, the empirical evidence contradicts those reported in Akram (2016). According to Akram (2016), domestic public debt can crowd in risky private sector investment and makes the banking system more efficient, leading to improved economic performance in the short run.

The other results for Model 2 reveal that investment (INV), labour (LBR), and savings (SAV) are positively related to economic growth, in the long run. More so, the coefficients of economic growth (Δy(1)), labour (ΔLBR(1)) and trade openness (ΔTOP(1)) are positive, implying that economic growth, labour and trade openness lagged by one period enhances economic performance in South Africa, in the short run. However, investment (ΔI), labour (ΔL), savings (ΔS) and terms of trade (ΔTOT) in the current period were found to have no significant impact on economic growth, in the short run. Unexpectedly, fiscal balance (FB) and trade openness (TOP) are negatively related to economic growth in South Africa, in the long run. Finally, the ECM(-1) terms for the aggregated and disaggregated public debt models are all negative and statistically significant – which confirms the existence of the long-run relationship of all variables in the two models.

The empirical results reported in this paper show that the impact of the aggregated public debt on economic growth in South Africa is negative, in the short run and in the long run. However, the impact of disaggregated public debt on economic growth varies depending on the type of government debt and time frame considered. Whereas domestic public debt exhibits a positive impact on economic growth in the short run, the impact becomes insignificant in the long run. Contrary, foreign public debt was found to be negatively related to economic growth in the long run and insignificant in the short run.

To check on the reliability of the results on public debt and economic growth models, four diagnostic tests were carried out, and the results are reported in Table 7.

Table 7: 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	0.068 [0.794]	4.861** [0.027]	0.445 [0.801]	0.621 [0.431]
Model 2	0.768 [0.381]	0.757 [0.371]	3.074 [0.218]	0.647 [0.421]

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

The results in Table 7 indicate that Model 2 passes the diagnostic test on serial correlation, normality and heteroscedasticity. Model 1, however, passes all the three diagnostic tests but fails on the functional form. The study proceeds to check for model stability by plotting the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMQ). The results of these tests are displayed in Figure 3 and Figure 4.

Figure 3: Plots of CUSUM and CUSUMQ – Model 1

CUSUM Plot	**CUSUMQ Plot**

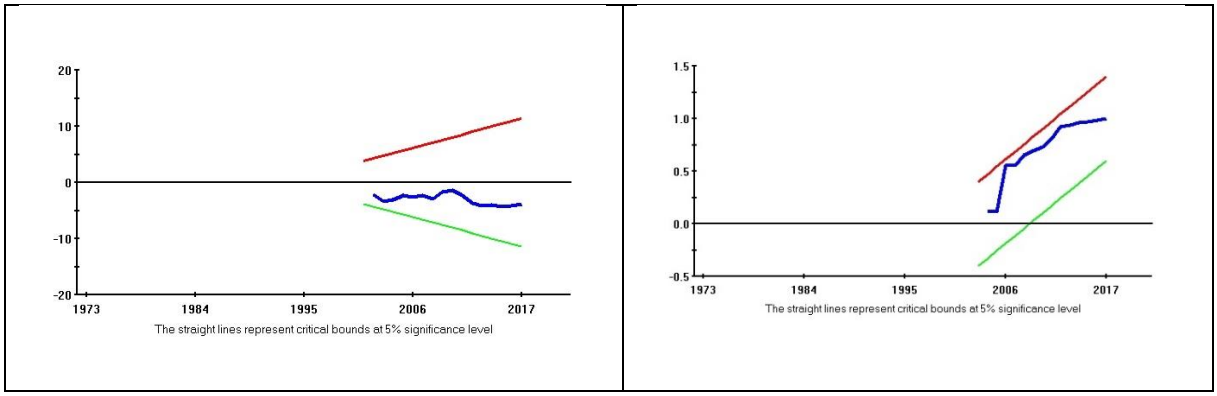
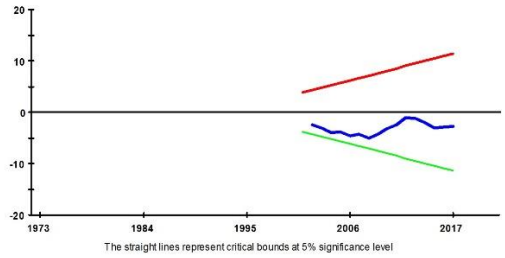
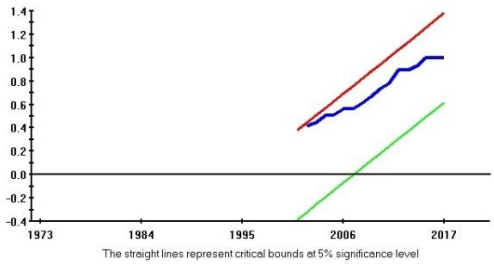


Figure 4: Plots of CUSUM and CUSUMQ – Model 2

CUSUM Plot	CUSUMQ Plot
	

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.

5. Concluding Remarks and Policy Implications

The principal objective of this study was to empirically examine the impact of public debt on economic growth in South Africa for the period from 1970 to 2017. Unlike most previous studies, the study tested the impact of aggregated public debt on economic growth, in addition to estimating the relative impact of domestic and foreign public debt on economic growth. This approach makes this study to be among the first to explore in detail the dynamic impact of public debt on economic growth in South Africa – using the ARDL model.

The empirical findings from the study reveal that the impact of the aggregated public debt on economic growth in South Africa is negative, both in the short run and in the long run. The results further reveal that the impact of disaggregated public debt (domestic and foreign) on economic growth depends on the type of government debt and time frame considered. Whereas domestic public debt exhibits a positive impact on economic growth in the short run, the impact

is insignificant in the long run. Contrary, foreign public debt was found to be negatively related to economic growth in the long run but is insignificant in the short run. The study results, therefore, tend to support the crowding out effect of both aggregated public debt and foreign public debt on economic growth in South Africa, in the long run. In line with the empirical evidence, the study recommends South African authorities to pursue appropriate domestic public debt policies and strategies with the intention of improving economic growth. However, the study cautions the country against growing foreign public debt to finance its increasing expenditure needs as this was found to have adverse effects on economic growth in the long run. The study, therefore, suggests that foreign public debt should be managed and used in more productive ventures and that it should not be allowed to reach unsustainable levels. Finally, since investment and savings were found to be growth enhancing, there is need for the continual implementation of investment and savings supportive policies by the South African government.

References

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

Adams, C.S., and Bevan, D.L. (2005) 'Fiscal deficits and growth in developing countries.' *Journal of Public Economics*, 89: 571-597.

African Development Bank, Organisation for Economic Co-operation and Development and United Nations Development Programme (2017). *African economic outlook 2017: Entrepreneurship and industrialisation.* [Online] Available from: <http://www.oecd.org/about/publishing/corrigenda.htm>. [Accessed 13 November 2017].

Afonso, A., and Jalles, J.T. (2013) 'Growth and productivity: The role of government debt.' *International Review of Economics and Finance*, 25: 384-407.

Ahmed, A.D. (2012) 'Debt burden, military spending and growth in sub-Saharan Africa: A dynamic panel data analysis.' Defence and Peace Economics, 23(5): 485-506.

Akram, N. (2015) 'Is public debt hindering economic growth of the Philippines?' *International Journal of Social Economics*, 42(3): 202-221.

Akram, N. (2016) 'Public debt and pro-poor economic growth evidence from South Asian countries.' *Economic Research-Ekonomska Istraživanja*, 29(1): 746-757.

Alesina, A. and Tabellini, G. (1989) 'External debt, capital flight and political risk.' *Journal of International Economics*, 27(3): 199-220.

Arnone, M. and 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.

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.

Baldacci, E., Kumar, M. (2010) *Fiscal deficits, public debt and sovereign bond yields*. IMF Working Paper. Forthcoming. Washington DC, International Monetary Fund.

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. ECB.

Boccia, R. (2013) *How the United States' high debt will weaken the economy and hurt Americans: Backgrounder*. Working Paper No. 2768. The Heritage Foundation. Leadership for America.

Bonga, W.G., Chirowa, F., and Nyamapfeni, N. (2015) 'Growth–debt nexus: An examination of public debt levels and debt crisis in Zimbabwe.' *Journal of Economics and Finance*, 6(2): 9-14.

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.

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

Chirwa, T.G., and Odhiambo, N.M. (2017) 'Sources of economic growth in Zambia: An empirical investigation.' *Global Business Review*, 18(2): 275-290.

Chowdhury, A.R. (2001) *External debt and growth in developing countries: A sensitivity and causal analysis.* WIDER Discussion Papers. World Institute for Development Economics.

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. Washington DC, International Monetary Fund.

Chudik, A., K. Mohaddes, M. Pesaran and M. Raissi (2016), "Long-run effects in large heterogeneous panel data models with cross-sectionally correlated errors", *Advances in Econometrics*, 36, 85-135. *Essays in Honour of Aman Ullah*, 36, 85-135, Emerald Publishing Ltd.

Chudik, A., Mohaddes, K., Pesaran, M., and Raissi, M. (2017) 'Is there a debt-threshold effect on output growth?' *Review of Economics and Statistics*, 99(1): 135-150.

Cordella, T., Ricci, L.A., and Ruiz-Arranz, M. (2010) 'Debt overhang or debt irrelevance?' IMF Staff Papers, 57(1):1-24.

De Grauwe, P. (2011) *The governance of a fragile Eurozone*. CEPS Working Document No. 346. CEPS.

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.

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

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

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.

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.

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.* Washington DC, International Monetary Fund.

Huang, Y., Panizza, U., and Varghese, R. (2018) *Does public debt crowd out corporate investment? international evidence*. IHEID Working Papers No. 08-2018. Economics Section. The Graduate Institute of International Studies. IHEID.

Hausmann, R., and Panizza, U. (2011) 'Redemption or abstinence? Original sin, currency mismatches and counter cyclical policies in the new millennium.' *Journal of Globalisation and Development*, 2(1): 8-31.

Johansen, S., and Juselius, K. (1990) 'Maximum likelihood estimation and inference on cointegration with applications to the demand for money.' *Oxford Bulletin of Economics and Statistics*, 52: 169-210.

Kobayashi, K. (2015) 'Public debt overhang and economic growth.' Policy Research Institute, Ministry of Finance, Japan, *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.

Krueger, A.O. (1987) 'Debt, and LDC growth.' *American Economic Review*, 77(2): 159-164.

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

Levy, A, and Chowdhury, K. (1993) 'An integrative analysis of external debt, capital accumulation and production in Latin America, Asia-Pacific and Sub-Saharan Africa.' *Journal of Economics and Finance*, 17(3):105-119.

Majam, T. (2017) 'Challenges in the public debt management in South Africa: Critical considerations.' *Administratio Publica*, 25(3): 195-209.

Makuyana, G., and Odhiambo, N.M. (2018) 'Public and private investment and economic growth in Zambia: A dynamic approach.' *Economia Internazionale/International Economics*, 71(4): 503-526.

Mehrotra, A.N., Miyajima, K., and Villar, A. (2012) 'Developments of domestic government bond markets in EMEs and their implications.' *Fiscal Policy, Public Debt and Monetary Policy in Emerging Market Economies*, 67: 31-50.

Mhlaba, N., and Phiri, A. (2019) 'Is public debt harmful towards economic growth? New evidence from South Africa.' *Cogent Economics & Finance*, 7: 1-15.

Minea, A., and Parent, A. (2012). Is high public debt always harmful to economic growth? 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. CERDI.

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

Mohanty, R.K., and Panda, S. (2019) *How does public debt affect the Indian macroeconomy? A structural VAR approach.* National Institute of Public Finance and Policy. New Delhi. India.

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

Muyambiri, B., and Odhiambo, N.M. (2018) 'Financial development and investment dynamics in Mauritius: A trivariate Granger-causality analysis.' *Spoudai Journal of Economics and Business*, 68(2-3): 62-73.

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

National Planning Commission. (2011) *National Development Plan: Our future makes it work*. Executive summary. National Planning Commission.

Nattrass, N., and Ardington, E. (1990) *The Political Economy of South Africa*. Oxford. Oxford University Press.

Nantwi, V.O., and Erickson, C. (2016) 'Public debt and economic growth in Ghana.' *African Development Review*, 28(4): 116-126.

Ncanywa, T., and Masoga, M.M. (2018) 'Can public debt stimulate public investment and economic growth in South Africa?' *Cogent Economics & Finance,* 6: 1-1.

Ndikumana, L., and Boyce, J.K. (2012) *Capital flight from North African countries*. Working Papers. PERI.

Odhiambo, N.M. (2011) 'Financial intermediaries versus financial markets: A South African experience.' *International Business & Economics Research Journal*, 10 (2): 77-84.

Pattillo, C., Poirson, H., and Ricci, L. (2004) *What are the channels through which external debt affects growth?* IMF Working Paper No. 04/15. Washington DC, International Monetary Fund.

Pattillo, C., Poirson, H., and Ricci, L.A. (2011) 'External debt and growth.' *Review of Economics and Institutions*. 2(3): 1-30.

Pesaran, M.H., and Shin, Y. (1999) *An autoregressive distributed lag modelling approach to cointegration analysis*. In, *Econometrics and Economic Theory in the 20th Century*, Storm, S. (ed). 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.

Presbitero, A. (2012) 'Domestic debt in low income countries.' *Economics Bulletin*, 32(2): 1099-1112.

Qudah, A.M. (2016) 'Public debt, external debt and economic growth of Jordan.' *International Journal of Research in Commerce and Management*, 7(4): 11-16.

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. (2010) 'Growth in a time of debt.' *American Economic Review,* 100(2): 573-578.

Republic of South Africa. (1998) *Macroeconomic slowdown and prospects for recovery*. National Treasury. The government of the Republic of South Africa.

Republic of South Africa. (2010) *The new growth path: The framework*. The government of the Republic of South Africa.

Republic of South Africa. (2011) *2010/11 Debt management report*. National Treasury. The government of the Republic of South Africa.

Republic of South Africa. (2012) *2011/12 Debt management report*. National Treasury. The government of the Republic of South Africa.

Republic of South Africa. (2014) *Twenty-year review: South Africa: 1994-2014*. Government of the Republic of South Africa.

Republic of South Africa. (2015) *Budget review*. National Treasury. Government Printers. Government of the Republic of South Africa.

Republic of South Africa. (2016a) *Budget review*. National Treasury. Government Printers.

Republic of South Africa. (2016b) *2015/16 Debt management report*. National Treasury. The government of Republic of South Africa.

Republic of South Africa. (2016c) *Government debt and contingency liabilities*. National Treasury. The government of the Republic of South Africa.

Romero, A., and 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*, by Calvo, G.A., Findlay, R., Kouri, P., and De Macedo, J.B. (eds). Basil Blackwell, Oxford.

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

Saungweme, T., and Odhiambo, N.M. (2018) 'Public debt dynamics in emerging market economies: The experience of South Africa.' *ACTA ADMINISTRATIO*, 10(1): 29-59.

Spilioti, S., and Vamvoukas, G. (2015) 'The impact of government debt on economic growth: An empirical investigation of the Greek market.' *The Journal of Economic Asymmetries*, 12(2015): 34-40.

South African Reserve Bank. (2017) *Economic financial data for South Africa*. [Online] Available from: <http://wwwrs.resbank.co.za/webindicators/econfindataforsa.aspx>. [Accessed 13 November 2017].

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.

Statistics South Africa. (2018) *Quarterly Bulletin of Statistics*. (Various issues). Pretoria. [Online] [Accessed 8 December 2018].

The Presidency. (2006) *Accelerated and shared growth initiative-South Africa (ASGISA): A summary, 2006*. Government of the Republic of South Africa.

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

World Bank. (2018) *World Bank Databank. World Development Indicators*. [Online]. Available from: <http://www.data.worldbank.org>. [Accessed 24 June 2019].

Yakita, A. (2008) 'Sustainability of public debt, public capital formation, and endogenous growth in an overlapping generation setting.' *Journal of Public Economics*, 92(4): 897-914.

Zaman, R., and Arslan, M. (2014) 'The role of external debt on economic growth: Evidence from Pakistan economy.' *Journal of Economics and Sustainable Development*, 5(24).