

# Public Debt in Post-Crisis South Africa

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**Mark Schoeman**

School of Economic and Business Sciences  
University of the Witwatersrand  
Johannesburg, South Africa  
mark.schoeman@saiia.org.za

**Dr. Kenneth Creamer**

School of Economic and Business Sciences  
University of the Witwatersrand  
Johannesburg, South Africa

## **Abstract**

*Almost nine years after the onset of the global financial crisis, South Africa is still struggling to consolidate the public debt it accrued running countercyclical fiscal policy. Large deficit spending necessitated by the downturn in growth and upturn in public employment caused South Africa's public debt level to escalate to 43.9% of GDP by 2014. This rapid increase in the level of public debt has caused great concern from many camps about the sustainability of South Africa's debt path. This study identifies and analyses the key components of South Africa's debt sustainability in the post-crisis period. The risks of South Africa running large fiscal deficits are evaluated with regard to both the level of public debt, and its associated interest payment burden. A variation of the Domar sustainability analysis is used to project South Africa's possible debt paths into the future. The study finds that South Africa's debt dynamics are a cause for concern where low post-crisis interest rates are not preventing the crowding out of government spending, and persistently high or even exploding levels of debt are possible outcomes unless serious fiscal consolidation is undertaken.*

**Keywords:** Public Debt; Debt Forecasts; Fiscal Policy; South Africa

**JEL Classification :** H68, H63

## 1. Introduction

Friday the 13<sup>th</sup> June 2014 marked a gloomy day for South Africa when Standard & Poor's (S&P), one of the largest international credit rating agencies, downgraded South Africa's sovereign credit rating to BBB-, one notch above the "junk" status shunned by many investors. S&P cited lacklustre growth, labour unrest, and a sizable current account deficit as the cause of the downgrade, stating that "the fiscal stance may become exposed to lower-than-expected economic growth, pressure from a new round of public-sector wage negotiations, and increased spending needs". Two years earlier, the other major credit rating agencies, Moody's and Fitch, had downgraded South Africa's rating outlook from stable to negative. Moody's argued that there was a "...growing risk that the political commitment to low budget deficits and the ability to keep within current debt targets could be undermined by popular pressures". Fitch was concerned with South Africa's failure to create jobs and pick up the pace of economic growth, noting that "...this inability has not only constrained growth and kept the tax base narrow, but has also caused public finances to become increasingly redistributive... The resultant narrowing of fiscal space undermines a key support to South Africa's creditworthiness".

Much of this story has to do with South Africa's poor economic performance since the onset of the global financial crisis almost nine years ago. The downgrading of South Africa's sovereign risk ratings is representative of the lasting impact the global recession, and the fiscal response it prompted, has had on South Africa's economy and fiscus. Financial contagion, the drop in world commodity prices, and the severe recession in South Africa's traditional trading partners served to turn GDP growth negative, cause massive job losses, and put increasing strain on public finances.

Emerging from a period of prudent fiscal policy management before the crisis, South Africa was able to use the considerable fiscal space it had created from three years of running a budget surplus to execute a significant fiscal policy response. The operation of automatic stabilisers was combined with a discretionary fiscal stimulus package designed to boost aggregate demand. The result was for government spending to quickly outstrip revenue, causing the fiscal balance to turn to a deficit. This difference between spending and revenue was financed by the accumulation of public debt. From a level of 26% of GDP in 2009, South Africa's debt/GDP ratio rapidly increased by almost 70% to a level of 43.9% of GDP by 2014<sup>1</sup>.

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<sup>1</sup> Source: South African Reserve Bank 2014

The credibility of rating agencies aside, the downgrading of South Africa's credit rating was representative of a growing view that South Africa's level of public debt is approaching, or has already surpassed, a level that is sustainable. Yet many in favour of maintaining deficit spending argue that a focus on debt/GDP ratios in sustainability analysis can be misleading. They press that high levels of debt can be financed in the low-interest-rate environment that often results in response to a recession. With such low interest rates, the interest-payment burden of public debt is reduced and servicing the debt stock is sufficient until the economy has recovered enough to pay back the capital.

The basis for these opposing views, and the theoretical framework for conducting a sustainability analysis, are set out in section 2. The relationship between public debt, deficits, and the interest rate is then investigated in section 3. The section traces the effects of the crisis on South Africa's interest rate and interest payment burden of public debt, and investigates whether interest expense is crowding out other forms of government spending. In Section 4, traditional concerns about the debt stock are tested by performing a scenario analysis based on a variation of the Domar sustainability analysis. This maps out the various pathways for the evolution of South Africa's public debt and interest payment burden into the future. The results of this study are discussed in section 5, and their implications for fiscal consolidation in South Africa explained.

## **2. Theoretical Framework**

The international trend of running large fiscal deficits and accumulating public debt during the crisis sparked intense debate about the sustainability of this type of response, and the correct time to transition to a contractionary fiscal position. The persistence and depth of the global recession polarised views on this matter. Deficit hawks were horrified at the escalating levels of public debt and had concern over the burden it would place on the economy in the future. On the other end of the spectrum, others cited persistent unemployment and the sluggish response of growth to stimulus as justification for further maintaining deficit spending.

These opposing views relate to debt sustainability - a government's ability to employ the same set of fiscal policies indefinitely without going bankrupt or defaulting on its debt. Traditionally, sustainability is viewed in terms of expressing a fiscal variable – be it debt, debt repayments, or the primary balance – as a ratio of some underlying macroeconomic variable, usually GDP. A public debt path is considered

sustainable, for example, for any path of the primary balance which keeps the debt/GDP ratio constant (Vera: 2009).

There are two main approaches to assessing the sustainability of a government's debt path: the Domar method, and the Present Value Constraint (PVC) approach<sup>2</sup>. The Domar method makes projections of future interest rates (payable on debt) and growth rates in order to determine what primary balance is required to keep the debt/GDP ratio stable, while the PVC method takes the present value of all future fiscal revenue and expenditures, and debt and debt repayments, to assess the 'affordability' of the government's current fiscal position (Vera: 2009). The Domar or traditional method, as taken from Cassimon et al (2008), draws on the theoretical decomposition of public debt into its various components:

$$D_t = D_{t-1} + iD_{t-1} + (I_g + C_g - T) - \Delta M = (1 + i)D_{t-1} + (B - \Delta M) \quad (1)$$

where  $D_t$  is the stock of public debt,  $i$  is the average nominal interest rate on public debt,  $I_g$  is government spending on infrastructure,  $C_g$  is recurrent government spending,  $T$  is domestic government revenue,  $\Delta M$  is monetary financing, and  $B$  is the primary (non-interest) government balance. Sustainability requires an investigation of the changes of debt indicators over time, normalised by the government's ability to service debt, such as GDP. With a few assumptions and simple algebra, the equation above can be rewritten :

$$\Delta d_t = b_t + (r - g)d_{t-1} \quad (2)$$

where  $d_t$  is the ratio of debt to GDP,  $r_t$  is the average real interest rate on debt,  $g_t$  is the real growth rate of GDP, and  $b_t$  is the ratio of the primary balance to GDP.

This equation reveals that two key factors affect the debt-to-GDP ratio over time: the difference between the average real interest rate on debt and the real growth rate of GDP (the interest-growth rate differential), and the primary balance. If the interest rate is higher than the GDP growth rate, the

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<sup>2</sup> Cassimon et al (2008) also consider an alternative debt sustainability assessment, termed the human development perspective, which measures a country's debt obligations against its ability to achieve its Millennium Development Goals. However, this method applies to external debt and considers debt forgiveness as one of its prescriptions, making its applicability limited to low-income countries with a history of debt defaulting.

interest payments on existing debt are rising faster than GDP and the government will have to run a primary surplus to keep the debt-to-GDP ratio constant, and run a sufficiently large surplus to reduce it. If, however, GDP growth exceeds the interest rate, keeping the debt-to-GDP ratio constant, or even reducing it, is compatible with a primary deficit (Carlin & Soskice: 2006). Essential to both of these methods is, therefore, an evaluation of the evolution of the rates of economic growth and interest on debt.

In performing a debt sustainability analysis, Vera (2009) provides a number of criticisms of the conventional methods which are important to keep in mind. Firstly, by assigning an active role to fiscal deficits, policy changes implemented to prevent high or exploding debt are often self-defeating. For example, reducing expenditure to aid in reducing a fiscal deficit could lead to a reduction in national income, and therefore tax revenue, worsening the debt situation. Secondly, the assumption that GDP and interest growth rates are unaffected by fiscal policy decisions is unrealistic. There could be many different combinations of macroeconomic variables resulting in sustainable debt paths, and the focus on maintaining a stable debt/GDP ratio can be misleading. Vera advises that a major improvement in conventional sustainability analysis must be the tracking and analysis of the long-run effects of fiscal policy on the economy, in particular growth and the interest rate. Lastly, the conventional approach also needs to take into account the impact of public investment spending, particularly infrastructure spending, on future revenue. This is particularly so in developing countries where public investment can act as a tool to stimulate private investment – a type of ‘crowding in’ effect. Given the consensus that infrastructure is a priority for the developing world to unlock economic potential in the private sector, the accumulation of debt to fund public investment can be justified if its returns exceed the cost of debt.

While traditional sustainability analysis focuses on the debt stock, in particular the debt/GDP ratio, others have argued that the level of the debt stock is not important as long as the government is able to service the debt and use the funding productively. In this vein of thought, a rising level of public debt is not dangerous in and of itself, so much as the rising fiscal outlays on its interest payments which will contribute to rising budget deficits in the future (Luiis: 2012). Of particular concern is the possibility that rising interest payments will consume a larger portion of fiscal expenditure, creating a growing opportunity cost of spending on social services and public investment.

Pollin (2012) argues in the context of the US that if the focus is shifted from the debt/GDP ratio to interest payments, a very different picture of sustainability is painted. Despite sharply rising debt/GDP

ratios, the average ratio of Federal interest payments to outlays between 1960 and 2010 was only 9.9%. He argues that despite the huge fiscal expansion in 2009, interest burdens on Federal debt will continue to be low due to suppressed borrowing rates from 2009 onwards. However, suppressed interest rates are a natural feature of recessions and are not necessarily permanent. While it is true that interest rates in the US and EU have remained low in the post-crisis period, Pollin's argument fails to take into account that fluctuations in the interest rate can occur relatively easily due to a number of external factors. Low interest rate cannot always be guaranteed in the wake of a crisis, and this uncertainty does little to allay sustainability concerns.

Theoretically, if rising levels of public debt contribute to perceptions that government bonds are risky, then a higher interest rate will be demanded by investors to compensate for this risk factor. This is often aggravated by credit rating agencies which incorporate debt sustainability into their risk profiling. A downgrading of a country's credit rating due to a perceived increase in the risk of default on public debt can have a large impact on investor confidence and the risk premium demanded on government bonds (Luiis: 2012). However, this situation is not always borne by evidence. With regards to the US, Pollin (2012) makes an interesting observation from the most recent crisis. From 2006 to 2010, sharply rising levels of public debt have corresponded with dropping Treasury bill rates. He attributes this to investors seeking safe havens for their investments in the face of the global crisis where US Treasury bills were perceived to be the safest, and the effect of the Fed's quantitative easing (QE) policy on suppressing interest rates.

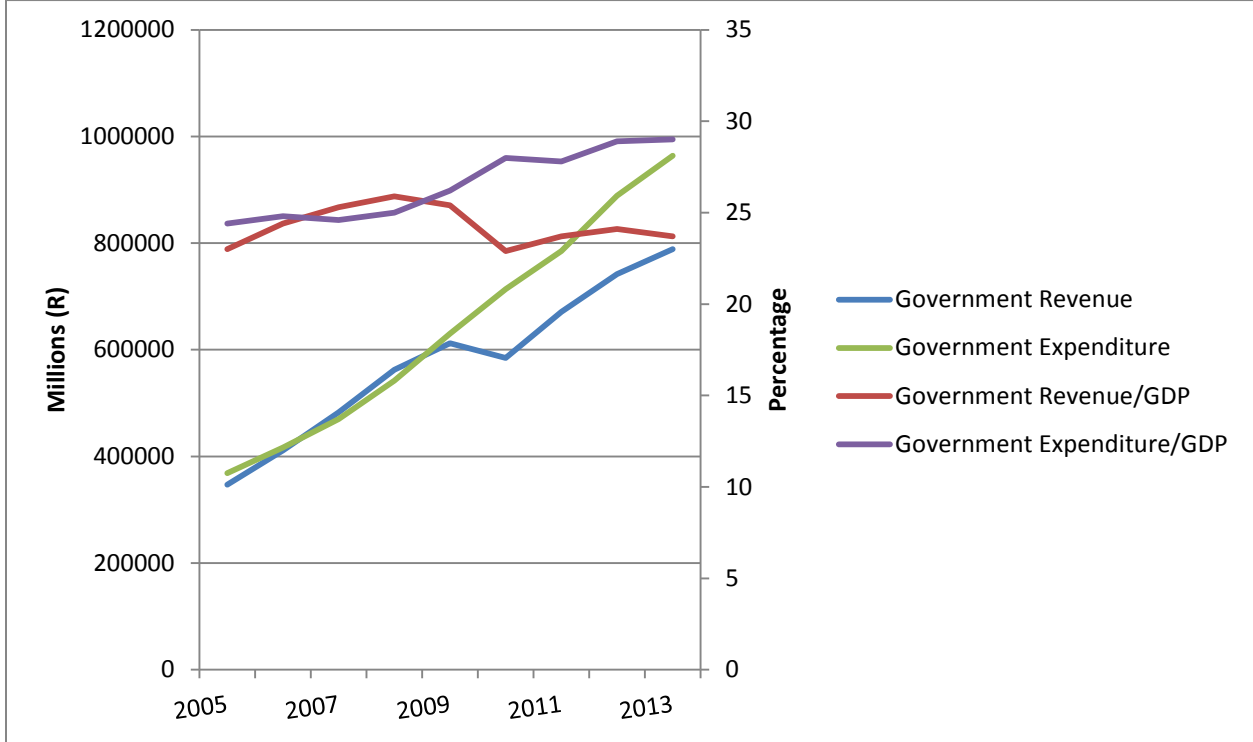
### **3. Deficits, Debt, and the Interest Rate**

The result of the crisis and the concurrent downturn in growth and increase in unemployment was to place increased pressure on the South African fiscus. Immediately prior to the onset of the recession, the South African Treasury had managed to create fiscal space by keeping government spending below its revenue collection. However, the downturn in growth during the recession caused a sharp downturn in the collection of tax revenue, and necessitated an increase in government spending through an increased public wage bill and discretionary fiscal spending (public investment).

Figure 1 below shows the actual value (measured on the left axis) and ratio to GDP (measured on the right axis) of fiscal revenue and expenditure in the run-up to and aftermath of the crisis. The graph shows how South Africa enjoyed a surplus of revenue over expenditure in 2007 and 2008, but the sharp

decline in revenue in 2009 coupled with the continued rise in expenditure causes the revenue- and expenditure-to-GDP ratios to diverge from 2009 onwards. Despite the pickup in revenue collection from 2011 onwards, the continuous increase in expenditure necessitated by the severity of the crisis has meant that there has been a deficit of government revenue over expenditure since the onset of the recession to present day.

**Figure 1: Impact of the Crisis on Fiscal Revenue and Expenditure**

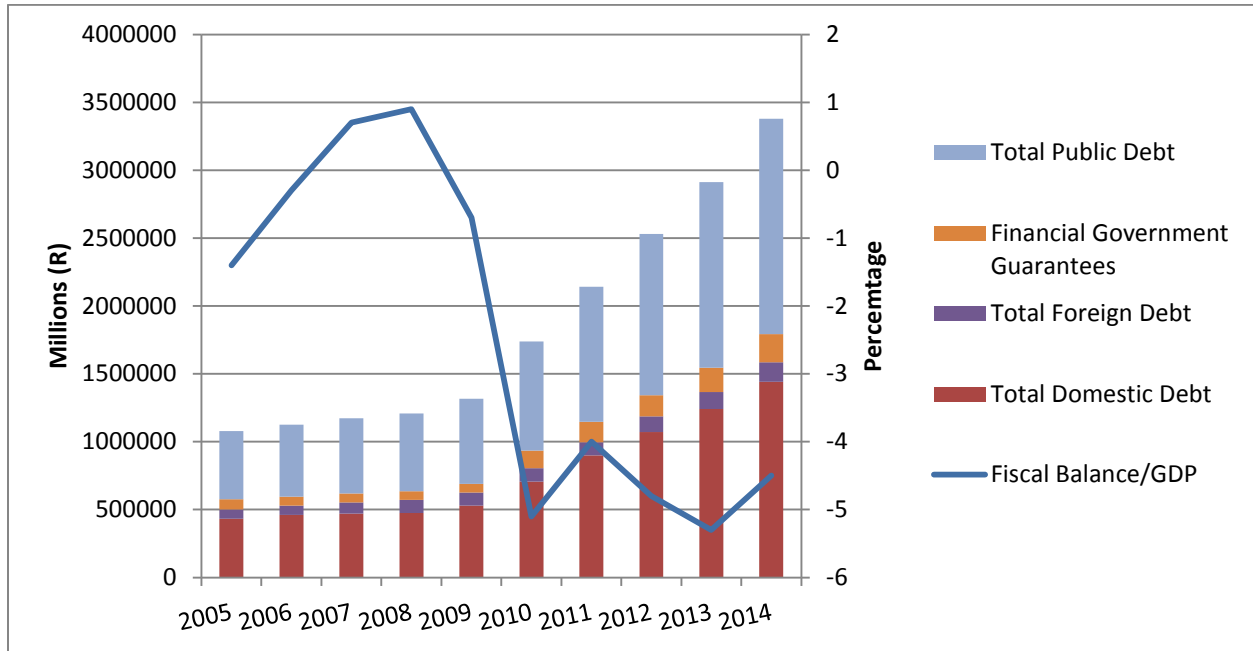


Data Source: South African Reserve Bank 2014.

This deficit has been financed by the accumulation of public debt. Figure 2 below shows the level of total public debt (measured on the left axis) broken down by domestic and foreign debt, as well as government guarantees, and the fiscal-balance-to-GDP ratio (measured on the right axis). The fiscal balance moves from surplus to deficit in 2009, where it remains in deficit to the present day. The movement from surplus to deficit corresponds with a sharp increase in the level of public debt from 2010 onwards. The result has been the sharp and continuous increase in South Africa’s debt/GDP ratio from a low of 26% in 2009 to 43.9% in 2014<sup>3</sup>, with Treasury estimating the ratio to increase to 48.3% by the 2016/2017 fiscal year (National Treasury: 2014).

<sup>3</sup> Source: South African Reserve Bank 2014.

**Figure 2: Public Debt and the Fiscal Balance**



Data Source: South African Reserve Bank 2014

South Africa clearly responded to the crisis with a strong countercyclical fiscal response. In combination with the operation of automatic stabilisers, a fiscal stimulus package was implemented in the form of discretionary spending to try and boost aggregate demand. While South Africa was in good company executing such a response, the orthodox view prior to the crisis questioned the value of discretionary fiscal policy in boosting growth in much of the literature. Furthermore, given the alarming rise in the level of public debt as a result of the response, many questioned whether the debt servicing obligations it induced was worth the positive effect it may have had on stabilising the economy

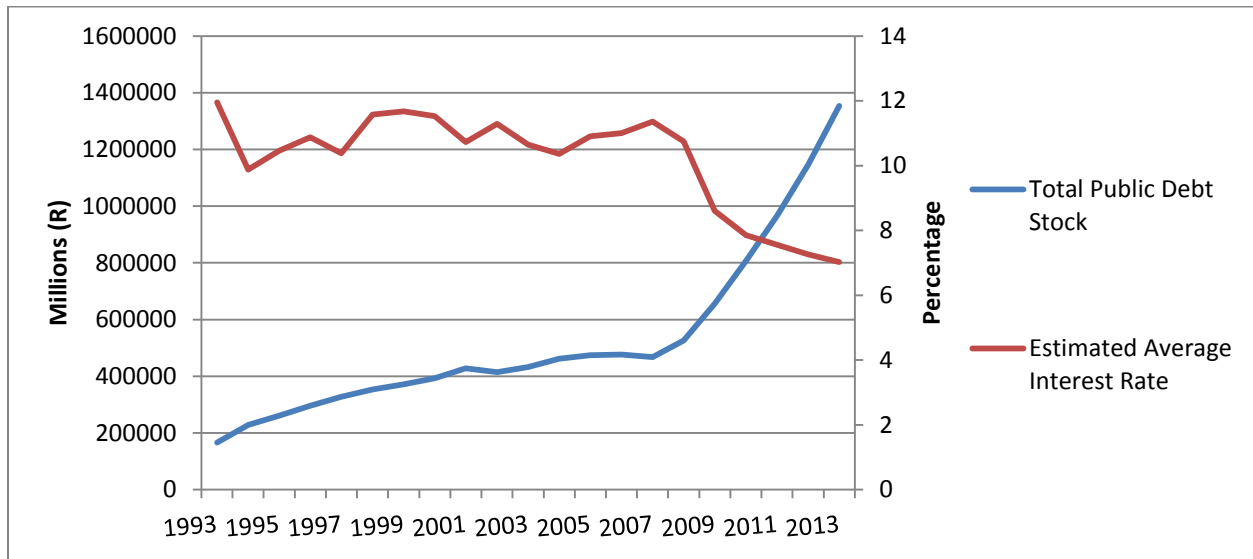
To assess the danger of the interest payment burden in South Africa, the relationship between the level of public debt and its corresponding interest rate is investigated. Figure 3 below shows the stock of national debt (measured on the left axis) and a rough estimate of its average interest rate<sup>4</sup> (measured on the right axis) from 1993 to 2013. Figure 4 below shows the stock and yield on marketable domestic government bonds for three different maturities: 0-3 years, 3-10 years<sup>5</sup>, and 10 years and over from 1986 to 2013.

<sup>4</sup> Calculated by dividing the interest expenditure by total public debt for each year.

<sup>5</sup> Due to data availability, the yield on 3-10 year bonds was estimated as the simple average between 3-5 year and 5-10 year bonds.

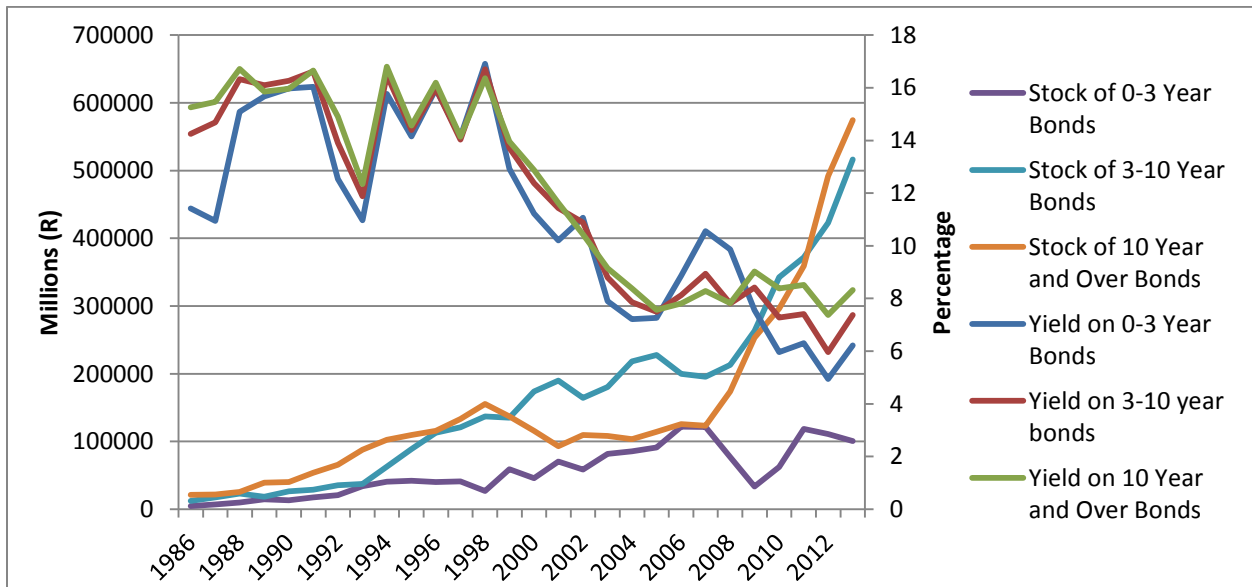


**Figure 3: Public Debt Stock and Estimated Average Interest Rate**



Data Source: South African Reserve Bank 2014 and author's own calculations

**Figure 4: Government Bond Stock and Yields**

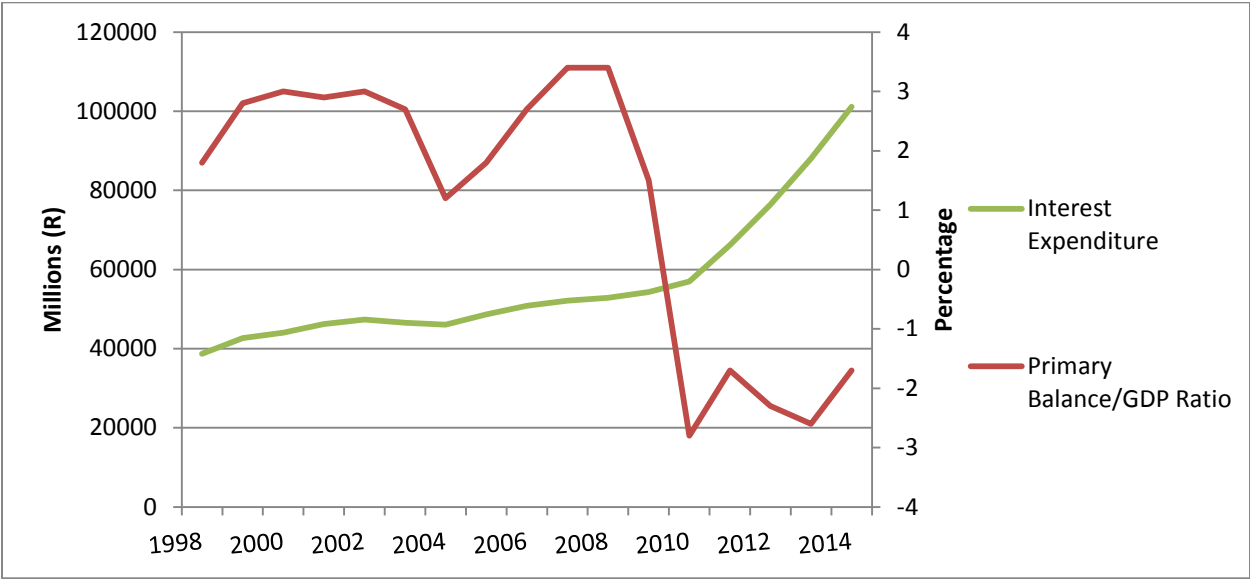


Data Source: South African Reserve Bank 2014 and author's own calculations

Both graphs above show a clear trend of a sharply increasing stock of public debt (with the exception of 0-3 year bonds) and a decrease in the corresponding interest rate since the onset of the crisis in 2008. It is therefore not the case, in post-crisis South Africa, that accumulating high levels of debt exerts an upward pressure on the interest rate. Rather, as the data reveals, the sharp increase in public debt after the crisis is associated with a decrease in the interest rate on that debt.

However, it is true that the accumulation of public debt through the running of a primary deficit during and after the crisis had a positive impact on the level of interest expenditure. Figure 5 below shows the relationship between interest expenditure (measured on the left axis) and the primary balance/GDP ratio (measured on the right axis) from 1998 – 2014.

**Figure 5: Primary Balance/GDP Ratio and Interest Expenditure**

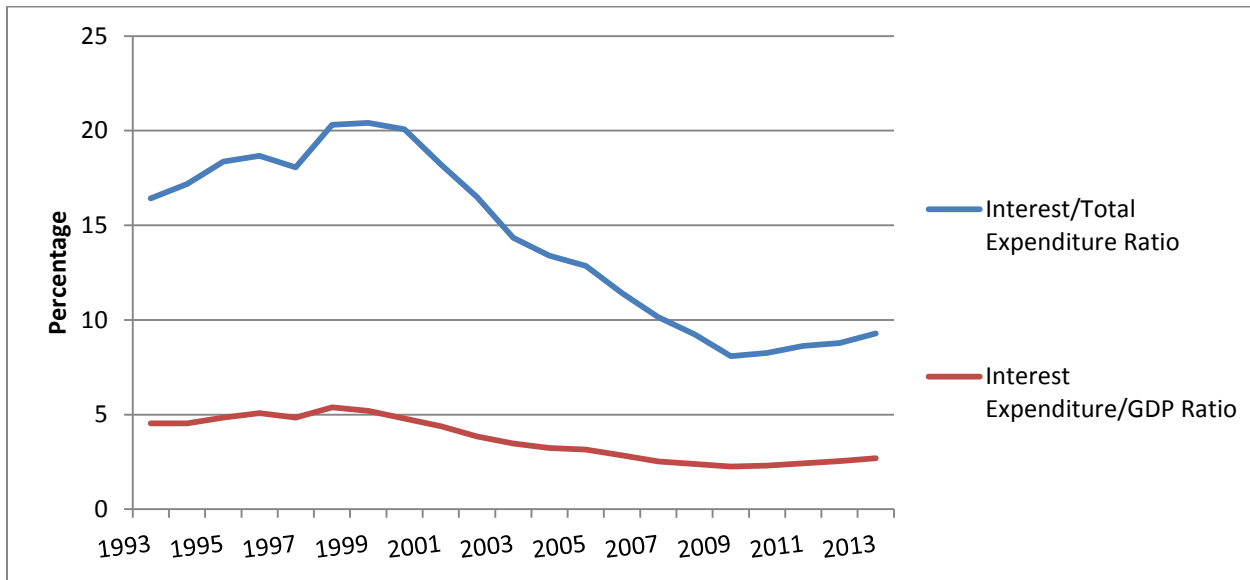


Data Source: South African Reserve Bank 2014

As is to be expected, the sharp decline in the primary balance/GDP ratio in 2009 to a deficit in 2010 causes the level of interest expenditure to increase substantially as the primary deficit adds to the debt stock, incurring larger interest payments.

Furthermore, this substantial increase in interest expenditure has crowded out other forms of government spending in the post-crisis period. Figure 6 below shows the evolution of South Africa’s interest/total expenditure ratio and interest expenditure/GDP ratio from 1993 to 2013.

**Figure 6: Interest/Total Expenditure and Interest Expenditure/GDP Ratios**



Data Source: South African Reserve Bank 2014

The ratio of interest to total expenditure has declined quite rapidly since 2000, until levelling out in 2010 after which there was a mild increase to 2013. Similarly, the ratio of interest expenditure to GDP has declined since 1998, levelling out in 2009 and increasing slightly thereafter. This is evidence that rising interest expenditure in the wake of the crisis has crowded out other forms of government spending.

#### **4. Debt and Interest Payment Projections**

The accumulation of South Africa's public debt during and after the crisis has caused concern that the magnitude of the debt stock has reached, or will continue to grow to unsustainable levels. To test this concern, a variation of the Domar sustainability analysis is performed in order to make projections about the future progression of South Africa's public debt stock and interest payment burden. While traditional debt sustainability analysis projections are based on the assumption that the conditions prevailing in the base year remain unchanged over the forecast period [thereby answering the question of what would happen to the debt ratio if the underlying budgetary situation and economic fundamentals are constant (Luiis: 2012)], this study takes Vera's (2009) advise and makes projections based on differing assumptions about the possible future value of these variables.

## 4.1. Debt Stock Projections

Three different scenarios are outlined based on assumptions about the future evolution of key macroeconomic variables: a best case, worst case, and more of the same scenario. For all scenarios, actual 2014 values for the debt/GDP ratio (d) and primary deficit/GDP ratio (b) are used as the base year. Values for the average GDP growth rate (g) and bond yield (r), and level of the primary deficit/GDP ratio over the projection period are chosen to project the progression of the debt/GDP ratio into the future, according to the following formulae:

$$d_n = d_{n-1} \times (1 + \Delta d_{n-1}) \quad (3)$$

$$\Delta d_n = [b_n + (r_n - g_n) \times d_n] \div 100 \quad (4)$$

### Scenario 1: More of the Same

In the first scenario, the current macroeconomic climate is extended into the future. An average GDP growth rate of 3.8% and bond yield of 5% is assumed, and the primary deficit/GDP ratio remains at a deficit of 1.7% of GDP. These assumptions and the results are displayed in Table 1 below<sup>6</sup>:

**Table 1: Debt Stock Projections for Scenario 1**

Base Year (2014)		Projection Period					
Debt/GDP Ratio (d)	Primary Balance/GDP Ratio (b)	Average GDP Growth (g)	Average Bond Yield (r)	Primary Balance/GDP Ratio (b)	2020 Debt/GDP Ratio (d)	2025 Debt/GDP Ratio (d)	2030 Debt/GDP Ratio (d)
43.9%	-1.7%	3.8%	5%	-1.7%	50.19%	56.32%	63.43%

Data Source: South African Reserve Bank 2014 and author's own calculations

This scenario projects an increase in South Africa's debt/GDP ratio of 20 percentage points by 2030 to 63.43%. The modest GDP growth is unable to generate a sufficient increase in fiscal revenue to offset the cost of servicing the debt stock with an interest-growth rate differential of 1.2%. Added to this is the accumulation of more debt through running a primary deficit of 1.7% of GDP throughout the forecast period. The result is an almost 50% increase in the debt/GDP ratio over a 16 year period, with the trend continuing into the future if growth remains below the interest rate and the primary deficit persists.

<sup>6</sup> See Appendix A for details of the calculations.

## Scenario 2: Best Case

In the second scenario, the macroeconomic climate improves from its current state. An average GDP growth rate of 5.1% and bond yield of 4% is assumed, and the fiscal position tends to improve over time. The assumption is made that the primary deficit decreases by 0.15% of GDP per year, turning to a primary surplus in 2026 where the surplus continues to increase by 0.15% of GDP per year until the end of the projection period. These assumptions and the results are displayed in Table 2 below<sup>7</sup>:

**Table 2: Debt Stock Projections for Scenario 2**

Base Year (2014)		Projection Period					
Debt/GDP Ratio (d)	Primary Balance/GDP Ratio (b)	Average GDP Growth (g)	Average Bond Yield (r)	Primary Balance/GDP Ratio (b)	2020 Debt/GDP Ratio (d)	2025 Debt/GDP Ratio (d)	2030 Debt/GDP Ratio (d)
43.9%	-1.7%	5.1%	4%	-1.7% - 0.7%	<b>46.14%</b>	<b>46.11%</b>	<b>44.40%</b>

Data Source: South African Reserve Bank 2014 and author's own calculations

This scenario projects a stable debt/GDP ratio over the forecast period which initially rises, and then decreases to almost the original value of approximately 44% of GDP. The strong GDP growth and low bond yields create an interest-growth rate differential of -1.1%, allowing the government to generate more tax revenue from debt creation than the debt servicing obligations. The debt/GDP ratio therefore rises only modestly to a maximum of 46.33% due to the running of a primary deficit until 2025, at which point the running of a primary surplus allows the ratio to decrease for the remainder of the forecast period. If the interest-growth differential remains negative, and the government is able to continue running a primary surplus, the debt/GDP ratio would continue to shrink into the future.

## Scenario 3: Worst Case

In the third scenario, the macroeconomic climate worsens from its current state. An average GDP growth rate of 2.3% and bond yield of 11% is assumed, and the fiscal position tends to worsen over time. The assumption is made that the primary deficit increases by 0.05% of GDP every two years until the end of the projection period. These assumptions and the results are represented in Table 3 below<sup>8</sup>:

<sup>7</sup> See Appendix B for details of the calculations.

<sup>8</sup> See Appendix C for details of the calculations.

**Table 3: Debt Stock Predictions for Scenario 3**

Base Year (2014)		Projection Period					
Debt/GDP Ratio (d)	Primary Balance/GDP Ratio (b)	Average GDP Growth (g)	Average bond yield (r)	Primary Balance/GDP Ratio (b)	2020 Debt/GDP Ratio (d)	2025 Debt/GDP Ratio (d)	2030 Debt/GDP Ratio (d)
43.9%	-1.7%	2.3%	11%	-1.7% - -3%	<b>62.89%</b>	<b>93.60%</b>	<b>167.51%</b>

Data Source: South African Reserve Bank 2014 and author's own calculations

This scenario represents a situation of exploding debt. The very low growth, combined with high bond yields, results in an interest-growth rate differential of 8.7%. Combined with the increasing primary deficit, the debt/GDP ratio escalates by over 400% to 167.51% of GDP by 2030. This clearly represents an unsustainable debt trap scenario where the level of debt exceeds the country's gross income and debt servicing obligations crowd out an increasing portion of government spending.

#### 4.2. Interest Payment Projections

Lastly, it is worthwhile considering what the various scenarios for the evolution of South Africa's public debt would imply for the interest payment burden in each case. This is undertaken by multiplying the debt/GDP ratio for each year by the assumed interest rate for the forecast period, yielding the projected ratio of interest expense to GDP. Since the assumed interest rates for each scenario are real rates, an inflation rate of 5% is assumed for each scenario and added to the assumed real interest rates to arrive at the nominal interest rate. Table 4<sup>9</sup> below details the results:

**Table 4: Interest Burden Projections**

Scenario	Assumed Interest Rate	2020 Interest Expense/GDP Ratio	2025 Interest Expense/GDP Ratio	2030 Interest Expense/GDP Ratio
1: More of the Same	10%	<b>5.02%</b>	<b>5.63%</b>	<b>6.34%</b>
2: Best Case	9%	<b>4.15%</b>	<b>4.15%</b>	<b>4.00%</b>
3: Worst Case	16%	<b>10.06%</b>	<b>14.98%</b>	<b>26.80%</b>

Data Source: author's own calculations

In the 'more of the same' and best case scenarios, the relatively low interest rates of 10 and 9% respectively ensure an interest burden which only rises modestly over time or, in fact, decreases. Scenario 1 sees an interest burden which grows continuously at a modest rate, growing to 6.34% of GDP by 2030 which will continue to rise into the future if the prevailing conditions remain. In Scenario 2, the

<sup>9</sup> See Appendix D for details of the calculations.

interest burden levels out by 2022 and then begins to decrease, reaching 4% of GDP by 2030 and continuing to fall into the future if the prevailing conditions remain unchanged. In the worst case, Scenario 3, the relatively high interest rate of 16% causes the interest burden to rise exponentially, reaching a maximum for the forecast period of 26.8% of GDP which will continue to rise into the future should the same conditions persist.

## **5. Discussion**

Orthodox theory may suggest that the accumulation of public debt among emerging markets places an upward pressure on interest rates and, therefore, on the interest payment burden as discussed in Section 2. This is particularly so in the context of the crisis where highly risk-averse investors switched to the perceived safest store of their wealth – US government bonds – which, in combination with QE and other accommodating monetary policies, kept US interest rates very low (Pollin: 2011). The risk spread between US government bonds and emerging market bonds therefore increased as investors demanded higher interest rates in emerging markets to compensate for the perceived lack of safety. Contrary to this, the interest rate on South Africa's public debt did not escalate with rising debt levels. In fact, it decreased during the onset of the crisis and into the post-crisis period.

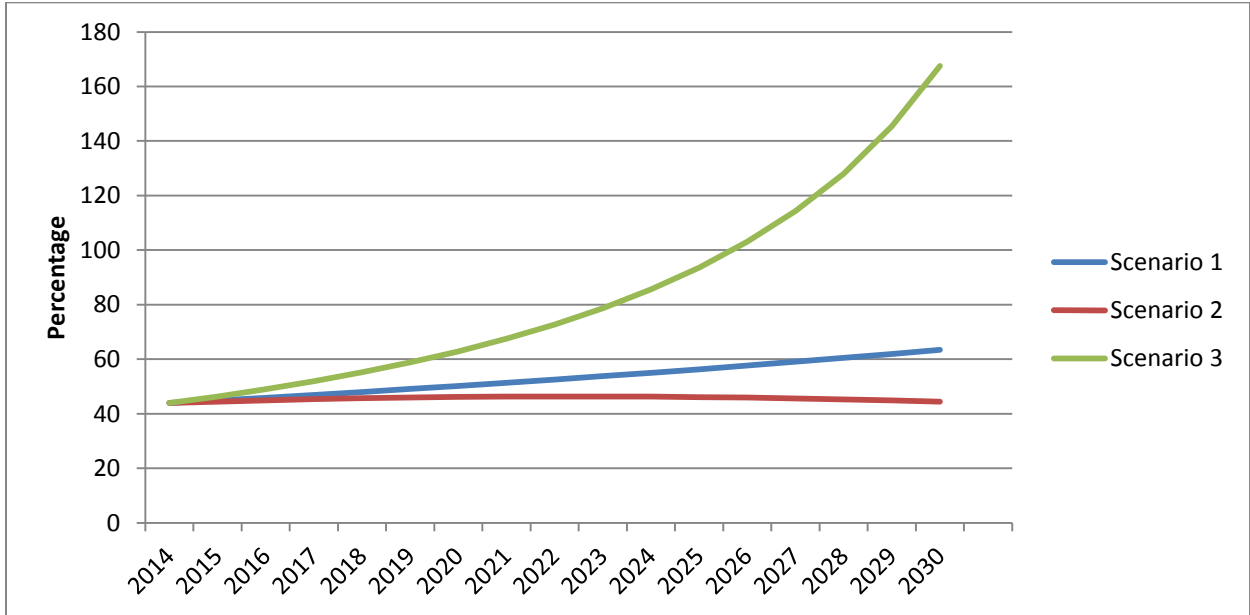
The reason for this may be twofold. Firstly, while the risk spread between US and South African bonds may have increased, within the domestic financial market South African bonds were perceived to be less risky than other South African financial assets considering the Treasury's reputation for prudent fiscal policy management. As such, investment in the South African financial market may have shifted from other types of securities to bonds, pushing up their price and suppressing their yields. Secondly, South Africa engaged in its own accommodating monetary policy which served to suppress interest rates across the board.

As a result, while there is evidence that the interest burden on public debt has crowded out other types of government spending in the post-crisis period, the extent of this crowding out has not been as significant as expected, with the interest/total expenditure and interest expenditure/GDP ratios rising only modestly since 2009. While this is partly due to the aggravated rise in government expenditure, it is also due to the relatively low interest rates charged on the public debt stock during this period. However, it is not clear that this means that the interest payment burden on the rising level of South

Africa’s public debt is sustainable, given that interest rates are subject to fluctuations and may not remain suppressed for long after a recession.

Representing this uncertainty, the public debt/GDP ratio progression of the three different scenarios is represented by Figure 7 below. The graph clearly spells out the implications of the combination of macroeconomic conditions and fiscal policy responses of each of the three scenarios outlined. The conventional wisdom of the Domar sustainability analysis is reemphasised by this study as the interest-growth rate differential and direction of the primary balance are the key determinants of the debt/GDP ratio’s forecast path. In Scenario 1, the slightly positive differential in combination with a stable primary deficit results in a debt/GDP ratio which increases consistently, while in Scenario 2 the negative differential and improving primary balance allows the debt/GDP ratio to stabilise and start to improve. However, in Scenario 3, the largely positive differential in combination with an increasing primary deficit causes the debt/GDP ratio to escalate exponentially.

**Figure 7: Public Debt/GDP Ratio Paths for each Scenario**



Data Source: South African Reserve Bank 2014 and author’s own calculations

These forecasts provide an important warning for South African policy-makers, if one is to believe that very high levels of debt can be dangerous. Even in the best case scenario of strong growth and prudent fiscal policy management, using 2014 values as the base year (where the effects of the crisis are still strongly felt) means that the debt/GDP ratio only stabilises in the medium term (up to 2030) and will only start to decrease in the long term if the same conditions remain. On the opposite end of the



spectrum, the worst case scenario of poor growth and fiscal policy management spells a disastrous outcome of exploding debt. This scenario emphasises how negative prevailing macroeconomic conditions in combination with poor fiscal policy can reinforce one another to result in a debt trap, from which escape is unlikely or extremely difficult. Picking up the momentum of debt accumulation in such scenarios is made worse by external factors, such as credit rating downgrades, which serve to dampen investment further and push up the risk premium that investors demand on emerging market bonds.

It is clear that growth is one of the most important aspects to guaranteeing a sustainable debt path into South Africa's future. Fiscal policy is, therefore, heavily affected by other types of economic policy which influence this preeminent variable. However, the primary balance/GDP ratio is one policy variable that fiscal policy-makers do have control over. As such, conventional wisdom about the pertinence of forward planning and sticking to expenditure targets, as well as securing the revenue base and preventing phenomena such as tax base erosion and profit shifting, is very apt.

The danger of high interest rates creating an overly burdensome interest payment obligation was further highlighted by the continuation of the scenario analysis to the interest burden. With modest forecasted interest rates of 10 and 9% in Scenarios 1 and 2 respectively, the interest burden as a percentage of GDP remains manageable at around the current 2014 level or lower. With a relatively high forecasted interest rate of 17% in Scenario 3, however, the interest burden on debt explodes and consumes almost 27% of GDP by 2030. In a country with a large need for government expenditure on social services and public investment, particularly within the realm of infrastructure, a fiscal situation where debt servicing obligations consumes close to 20% of the national income is not at all advisable. This is particularly so considering the opportunity cost of crowding out these other aspects of government spending on long term growth and prosperity.

With dampened future growth due to an increasing share of government expenditure being consumed by debt servicing, the fiscal situation can only worsen in the future, creating larger interest obligations, further crowding out the necessary government spending and creating a cycle from which it is difficult to escape. However, if it is the case that the increasing interest burden is caused by a rising stock of debt that is being used to finance productive investments that have positive effects on long-term growth and prosperity, this would mitigate some of these sustainability concerns.

## 6. Conclusion

The 2008/2009 global crisis was a historical event, both because of its size and persistence, and because of the way it caused economists to re-evaluate what they think and know about fiscal policy. In particular, the orthodox view which placed fiscal policy on the back-burner of short-term macroeconomic stabilisation was challenged by the unprecedented use of discretionary fiscal policy. The result has been a global increase in deficit spending and the accumulation of public debt, sparking sustainability concerns and intense debates about the correct timing for austerity measures. South Africa is no exception with a sharply rising debt/GDP ratio since the onset of the crisis. The rising levels of South Africa's public debt stock, in conjunction with the downgrading of South Africa's credit risk rating by all three of the major international agencies in the post-crisis period, has cast doubt on the sustainability of South Africa's fiscal position and lent credence to the suggestion of implementing fiscal rules.

This study provided insight into this issue by identifying and analysing the key components of South Africa's debt sustainability. Despite the seriousness of South Africa's public debt level, escalating levels of debt in the post-crisis period have not caused interest rates on public debt to increase. In fact, these rates have decreased since 2009. Nevertheless, the accumulation of the debt stock has caused South Africa's interest payments in the post-crisis period to increase. These increasing interest payments have crowded out other types of government expenditure, although not in the magnitude that may be expected, partly because total expenditure has increase by more than interest spending, and partly because of the relatively low rates of interest on public debt already discussed. However, it was noted that suppressed interest rates are a natural feature of a recession and are often temporary. The scenario forecasting undertaken in this study highlighted the importance of the future interest rate path in determining the sustainability of South Africa's interest burden, and concluded that if the prevailing low interest rates are not kept at their current levels, the interest burden would likely crowd out important government spending to an even greater degree in the future.

The debt stock projections served to emphasise the conventional wisdom of the Domar sustainability analysis which identifies the interest-growth rate differential and the level of the primary balance as the key drivers of the future debt stock path. The scenario analysis performed provided a worrying picture of South Africa's future debt path, where a situation of debt which does not decrease, or even explodes, are possible outcomes unless serious fiscal consolidation is undertaken. This is especially so considering

the effect that external factors, such as perceptions of sovereign risk garnered by credit rating agencies, can have in locking in negative cycles of interest rate and debt hikes. The analysis highlighted the importance of strong growth in guaranteeing a stable or decreasing debt path for South Africa, and the need for consolidating expenditure and securing the revenue base. To this end, South Africa's notable representation on the G20 as the only African member is an important step towards achieving the international cooperation that is needed to prevent tax base erosion and profit shifting.

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## Appendices

### Appendix A: Calculations for Debt Stock Projections for Scenario 1

Year	Debt/GDP ratio % (d)	GDP growth rate (g)	Bond yield (r)	Change in Debt/GDP ratio ( $\Delta d$ )	Primary deficit/GDP % (b)
2014	43.9000	0.038	0.05	0.0223	1.7
2015	44.8776	0.038	0.05	0.0224	1.7
2016	45.8822	0.038	0.05	0.0225	1.7
2017	46.9148	0.038	0.05	0.0226	1.7
2018	47.9765	0.038	0.05	0.0228	1.7
2019	49.0683	0.038	0.05	0.0229	1.7
2020	50.1913	0.038	0.05	0.0230	1.7
2021	51.3469	0.038	0.05	0.0232	1.7
2022	52.5362	0.038	0.05	0.0233	1.7
2023	53.7605	0.038	0.05	0.0235	1.7
2024	55.0212	0.038	0.05	0.0236	1.7
2025	56.3199	0.038	0.05	0.0238	1.7
2026	57.6580	0.038	0.05	0.0239	1.7
2027	59.0371	0.038	0.05	0.0241	1.7
2028	60.4590	0.038	0.05	0.0243	1.7
2029	61.9254	0.038	0.05	0.0244	1.7
2030	63.4383	0.038	0.05	0.0246	1.7

Notes:

1.  $\Delta d_n$  calculated as  $[b_n + (r_n - g_n) \times d_n] \div 100$  ... (A1)

2.  $d_n$  for forecast period calculated as  $d_{n-1} \times (1 + \Delta d_{n-1})$  ... (A2)

## Appendix B: Calculations for Debt Stock Projections for Scenario 2

Year	Debt/GDP ratio % (d)	GDP growth rate (g)	Bond yield (r)	Change in Debt/GDP ratio ( $\Delta d$ )	Primary deficit/GDP % (b)
2014	43.9000	0.051	0.04	0.0122	1.7
2015	44.4343	0.051	0.04	0.0106	1.55
2016	44.9059	0.051	0.04	0.0091	1.4
2017	45.3127	0.051	0.04	0.0075	1.25
2018	45.6533	0.051	0.04	0.0060	1.1
2019	45.9262	0.051	0.04	0.0044	0.95
2020	46.1305	0.051	0.04	0.0029	0.8
2021	46.2654	0.051	0.04	0.0014	0.65
2022	46.3307	0.051	0.04	-0.0001	0.5
2023	46.3262	0.051	0.04	-0.0016	0.35
2024	46.2523	0.051	0.04	-0.0031	0.2
2025	46.1095	0.051	0.04	-0.0046	0.05
2026	45.8987	0.051	0.04	-0.0060	-0.1
2027	45.6210	0.051	0.04	-0.0075	-0.25
2028	45.2781	0.051	0.04	-0.0090	-0.4
2029	44.8714	0.051	0.04	-0.0104	-0.55
2030	44.4032	0.051	0.04	-0.0119	-0.7

Notes:

1.  $\Delta d_n$  calculated as  $[b_n + (r_n - g_n) \times d_n] \div 100$  ... (B1)

2.  $d_n$  for forecast period calculated as  $d_{n-1} \times (1 + \Delta d_{n-1})$  ... (B2)

### Appendix C: Calculations for Debt Stock Projections for Scenario 3

Year	Debt/GDP ratio % (d)	GDP growth rate (g)	Bond yield (r)	Change in Debt/GDP ratio ( $\Delta d$ )	Primary deficit/GDP % (b)
2014	43.9000	0.023	0.11	0.0552	1.7
2015	46.3230	0.023	0.11	0.0573	1.7
2016	48.9773	0.023	0.11	0.0601	1.75
2017	51.9214	0.023	0.11	0.0627	1.75
2018	55.1754	0.023	0.11	0.0660	1.8
2019	58.8171	0.023	0.11	0.0692	1.8
2020	62.8855	0.023	0.11	0.0732	1.85
2021	67.4894	0.023	0.11	0.0772	1.85
2022	72.7006	0.023	0.11	0.0822	1.9
2023	78.6802	0.023	0.11	0.0875	1.9
2024	85.5609	0.023	0.11	0.0939	1.95
2025	93.5984	0.023	0.11	0.1009	1.95
2026	103.0453	0.023	0.11	0.1096	2
2027	114.3441	0.023	0.11	0.1195	2
2028	128.0059	0.023	0.11	0.1364	2.5
2029	145.4615	0.023	0.11	0.1516	2.5
2030	167.5064	0.023	0.11	0.1757	3

Notes:

1.  $\Delta d_n$  calculated as  $[b_n + (r_n - g_n) \times d_n] \div 100$  ... (C1)
2.  $d_n$  for forecast period calculated as  $d_{n-1} \times (1 + \Delta d_{n-1})$  ... (C2)

## Appendix D: Calculations for Interest Payment Projections

Year	Scenario 1			Scenario 2			Scenario 3		
	Debt/GDP Ratio (%)	Interest Rate	Interest Expense/GDP Ratio (%)	Debt/GDP Ratio (%)	Interest Rate	Interest Expense/GDP Ratio (%)	Debt/GDP Ratio	Interest Rate	Interest Expense/GDP Ratio (%)
2014	43.9000	0.1	4.3900	43.9000	0.09	3.9510	43.9000	0.16	7.0240
2015	44.8776	0.1	4.4878	44.4343	0.09	3.9991	46.3230	0.16	7.4117
2016	45.8822	0.1	4.5882	44.9059	0.09	4.0415	48.9773	0.16	7.8364
2017	46.9148	0.1	4.6915	45.3127	0.09	4.0781	51.9214	0.16	8.3074
2018	47.9765	0.1	4.7976	45.6533	0.09	4.1088	55.1754	0.16	8.8281
2019	49.0683	0.1	4.9068	45.9262	0.09	4.1334	58.8171	0.16	9.4107
2020	50.1913	0.1	5.0191	46.1305	0.09	4.1517	62.8855	0.16	10.0617
2021	51.3469	0.1	5.1347	46.2654	0.09	4.1639	67.4894	0.16	10.7983
2022	52.5362	0.1	5.2536	46.3307	0.09	4.1698	72.7006	0.16	11.6321
2023	53.7605	0.1	5.3760	46.3262	0.09	4.1694	78.6802	0.16	12.5888
2024	55.0212	0.1	5.5021	46.2523	0.09	4.1627	85.5609	0.16	13.6897
2025	56.3199	0.1	5.6320	46.1095	0.09	4.1499	93.5984	0.16	14.9757
2026	57.6580	0.1	5.7658	45.8987	0.09	4.1309	103.0453	0.16	16.4872
2027	59.0371	0.1	5.9037	45.6210	0.09	4.1059	114.3441	0.16	18.2951
2028	60.4590	0.1	6.0459	45.2781	0.09	4.0750	128.0059	0.16	20.4809
2029	61.9254	0.1	6.1925	44.8714	0.09	4.0384	145.4615	0.16	23.2738
2030	63.4383	0.1	6.3438	44.4032	0.09	3.9963	167.5064	0.16	26.8010

### Notes:

1. All interest expense/GDP ratios are calculated by multiplying the debt/GDP ratio by the prevailing interest rate for each year
2. The prevailing nominal interest rate for each year is calculated as the assumed real interest rate for each scenario plus an assumed 5% inflation rate.