FINANCIAL GUARANTEES AND PUBLIC DEBT IN SOUTH AFRICA

Ogutu Miruka, Gisele Mah**, Mamello A. Nchake****

Abstract

A few years since the worst of the Euro sovereign debt crisis, many nations, from Cyprus to Ireland, including South Africa are re-visiting their public debt management to avert or lessen the impact of similar such happenings in the future. There are a number of studies on risk assessments of fiscal sustainability; however, few focus on contingent liabilities and even fewer on financial guarantees. In South Africa, financial guarantees have consistently comprised just above or below 50% of all contingent liabilities since the early days of majoritarian rule. In lieu of this, the paper analyses the risks posed by financial guarantees to fiscal sustainability in South Africa. We estimate the effect of financial guarantees on public debt in South Africa via the Engle Granger and causality model with quarterly time series data obtained from the South African Reserve Bank (SARB) as well as the National Treasury. The data covers the April 1997 to December 2011 period. All econometric methods were executed using the statistical software package E-Views 7. We found that no long run relationship exists between national net loan debt and financial guarantees in South Africa. The pass rate of financial guarantees significantly affects its present value. The pass rate of financial guarantees has a predicting ability in determining the present value of national net loan debt. These findings may be contrary to what would be expected in the case of South Africa considering that the country is managing the issuance of financial guarantees prudently and that at present levels, there is no need for a radical policy shift. The study therefore offers a lesson to similar merging economies on the good governance of contingent liabilities.

Keywords: Financial Guarantees, Contingent Liabilities, Fiscal Risks, Fiscal Sustainability, Granger Causality, South Africa

**Graduate School of Business & Government Leadership, North West University, South Africa*
***School of Economics and Decision Sciences, North West University, South Africa*
****School of Economics, University of Cape Town, South Africa*

1 Introduction

A few years since the worst of the Euro sovereign debt crisis, many nations, from Cyprus to Ireland, including South Africa are re-visiting their public debt management to avert or lessen the impact of similar such happenings in the future. This study is a follow up on our earlier investigation on the same subject (see, Miruka, Mukuddem-Petersen & Meniago 2013) but which used a different methodology. In South Africa, financial guarantees have consistently comprised just above or below 50% of all contingent liabilities since the early days of majoritarian rule. In lieu of this, the paper analyses the risks posed by financial guarantees to fiscal sustainability in South Africa using a more robust estimation.

We estimate the effect of financial guarantees on public debt in South Africa via the Engle Granger and causality model with quarterly time series data obtained from the South African Reserve Bank (SARB) as well as the National Treasury. The data extends from April 1997 to December 2011. All econometric methods were executed using the statistical software package E-Views 7. We found that no long run relationship exists between national net loan debt and financial guarantees in South Africa. The past rate of financial guarantees significantly affects its present value. The pass rate of financial guarantees has a predicting ability in determining the present value of national net loan debt.

2 Financial guarantees and fiscal sustainability in South Africa

Fiscal sustainability remains a controversial issue and most economists put a focus on it due to the sharp sovereign debt crisis. The issue of fiscal sustainability is usually addressed by analysing economic variables such as growth rate of gross rate domestic product, growth rate of public debt and average interest rate on public debt. As Tshiswaka-Kashala (2006) shows, fiscal sustainability has been defined in many ways. At its simplest, fiscal sustainability can be viewed as the ability of a government to sustain its current spending, tax and other policies in the long run without threatening government solvency or

defaulting on some of its liabilities or promised expenditures. We can therefore say that fiscal sustainability concerns whether the government is in a position of keeping a given expenditure pattern, taxation, and borrowing pattern indefinitely, or whether it will be ultimately constrained to alter those policy settings to satisfy its long-run budget constraint. In other words, fiscal sustainability refers to the ability of the government to maintain a given policy stance in the future in spite of any shocks to the system which may arise (Tshiswaka-Kashala 2006).

Furthermore, many scholars define fiscal sustainability to include solvency of the government, recapitulated stable economic growth, equable taxes and intergenerational fairness (see, for instance, Hamilton & Viegi 2009; Ajam & Janine 2007; Aron, J and Muellbauer, J 2005). In the case of South Africa, and given the service delivery backlogs occasioned by apartheid, a sustainable fiscal policy must pay regard to the stability of the macroeconomic environment that fosters sustainable and inclusive economic growth and strengthen fiscal discipline to avoid populist fiscal policies that may lead to unsustainable levels of debt and seignorage especially during this electioneering period[9]. This would ensure that such policy can be pursued for long periods without any major interventions in tax and spending patterns. To put it differently, current policy as defined by the current legislation and policy decisions determining the evolution of tax and spending ratios can be maintained indefinitely without resulting in excessive debt accumulation.

All over the world, governments often avoid default by changing their fiscal policy when it becomes clear that it is unsustainable. Because of this reality, scholars of fiscal sustainability focus not on default itself, but on the feasibility, types and consequences of fiscal policy reforms needed to avoid default in the future. The recent financial downturn that led to an increase in budgetary deficits and public debt, first among the so-called PIIGS (Portugal, Ireland, Italy, Greece and Spain) and then in the United States has re-ignited debates on what constitutes efficient fiscal policy. Researchers need to identify quick and positive responses to shocks on public debt in order to absorb them and to avoid transforming them into systemic risk.

From the proceedings above, fiscal solvability is therefore one of the main issues that governments have to overcome. Radulescu (2012) indicated that financial markets had not paid enough attention to public finance imbalances before 2007, but they are doing right now by lending high priced money. Hence, Campeanu & Gyorgy (2009) indicated that government should introduce fiscal policies that manage to create primary surplus in order to achieve fiscal sustainability. In addition, Campeanu (2011) emphasized the importance of using the best fiscal and budgetary tools to overcome the current challenges that governments have to overcome within a very fragile fiscal context. Brasoveanu-Obreja and Brasoveanu (2012) showed that choosing the most appropriate composition of fiscal adjustment could lead to a sizeable reduction of budgetary deficit but also to economic growth. They indicated that fiscal adjustments based on decreasing government spending are successful and expansionary.

2.1 Financial guarantees

By definition, financial guarantees are non-cancellable indemnity bond that is backed by an insurer in order to guarantee investors that principal and interest payments will be made (Bajo & Primorac 2011). As Bajo & Primorac (2011) explains, financial guarantees can be viewed as an instrument of credit enhancement which insure security purchasers against default and provide lower borrowing costs of issuers. Financial guarantees work primarily by providing investors with an additional level of comfort that the investment will be repaid in the event that the securities issuer would not be able to fulfil the contractual obligation to make timely payments. Furthermore, financial guarantees help to lower the cost of financing for issuers because the guarantee typically earns the security a higher credit rating and therefore lower interest rates. It is for these reasons amongst others that government typically issue financial guarantees.

It follows from the proceedings above that one of the benefits of the financial guarantee is that it can help the debtor to secure a more attractive interest rate on the loan or other debt instrument. As is apparent, the guarantee helps to lower the degree of risk that the lender is taking on in order to approve the loan. This is achieved by ensuring the lender is covered in the event that the debtor becomes unable to make payments on time or not at all. It is even cheaper considering that out of pocket expenses troubles associated with collections efforts or the loss of any amount remaining due on the debt instrument are eliminated in this type of arrangement. Thus, for countries competing for direct foreign investments such as South Africa, financial guarantees are one way of attracting specific investors.

For major public works such energy and infrastructure undertakings, such arrangements may benefit state-owned enterprises by enhancing the entities' creditworthiness and thereby lowering the cost of financing. For state firms especially, financial guarantees are particularly handy since the bond represents an unconditional guarantee of compliance and a preferred interest rate is often offered.

Guarantees are often used as a kind of aid for projects or activities producing a significant welfare effect such as roads, dams, major housing projects and

[9] See, also Calitz, E. (2000) 'Fiscal implications of the economic globalisation of South Africa,' *Journal of African Economies*, Vol. 9 (2): 189-212. Even though dated, this study was very useful for our research given its then ground-breaking insights.

so on. In most cases, financial guarantees are issued to cover, partly or fully, risk in instances when the debtor is unable to repay a debt or meet another liability which has been guaranteed, or when the borrower fails to meet their liabilities within the agreed time limit. As Bajo & Primorac (2011) explain in the case of Croatia, some financial guarantees are essentially performance bonds with a payment guarantee element similar to license or permit bonds.

Typically, guarantees usually involve a minimum of three parties. In the first instance, we find the beneficiary. As Winpenny (2006) explains, the beneficiary is the entity in whose favour the guarantee has been issued and therefore requires security against the risk of the principal's non-performance or default under the primary contractual obligation. Second, we find the applicant. The applicant applies for the issue of a guarantee which covers performance as described by a contract. The applicant can, in the course of the contract, expect to be informed if there is a breach of contract. The final entity is the guarantor. The guarantee may be the state, a bank or party that issues the guarantee on behalf of the applicant. The guarantor is usually the applicant's bank which is situated in the same country as the applicant (Winpenny 2006).

Interestingly, financial guarantees are relevant to countries at all levels of social and economic development. Both supply and demand factors explain their pattern of use and may pull in opposite directions, but demand usually predominates and developing economies are especially vulnerable. In many instances, developing countries are forced to resort to financial guarantees to assuage the fears of foreign capital. Nevertheless, we know that financial guarantees alone cannot compensate for the absence of certain macro-economic fundamentals which drive investments, job-creation and growth. These include market size, natural resource endowment, the presence of bankable projects and good sponsors, essential infrastructure, adequate institutions, financial and legal systems including sound banks, lively sub-sovereign entities and good public governance generally. Many of these fundamental factors are related to the level of economic development and insofar as this applies, the distribution of financial guarantees will be correlated with the level of investment and development.

Maximising the impact of financial guarantees depends on good judgement to know when material conditions are approaching a state where the injection of a guarantee will lead to a positive outcome. In most cases, guarantees may have a greater influence in the presence of certain favourable conditions and there will be more opportunities for the successful use of guarantees where these conditions can be created.

As we argued previously (see Miruka, Mukuddem-Petersen & Meniago 2013), the domino-effect of financial crises in the world presently means that governments are facing increasing fiscal risks and uncertainties. One such risk is contingent liabilities that may be incurred depending on future events. However, it is difficult to forecast the probability of the contingency occurring and the magnitude of the government outlay required to settle the ensuing obligation (Polackova 1998). This probability and magnitude depend on some exogenous conditions, such as the occurrence of a particular event (for example, a natural disaster, a banking or financial crisis) and some endogenous conditions, such as the design of government programs (an example being the contracts for state guarantees and insurance), as well as on the quality and enforcement of regulations and supervision.

State-owned entities are mandated to give effect to government's priorities. In fact, South Africa's main entities are in energy, rail, roads, ports, water and sanitation. In particular, the government's financial guarantee exposure is mostly committed to state-owned entities and development finance institutions that are essential for the effective and efficient management of natural resources, tourism, information technology and manufacturing sectors. These sectors are principal drivers of the formal sector economy, and provide for the bulk of economic growth as well as potential job creation and poverty alleviation. These state-owned entities need to borrow against their balance sheets in order to invest in infrastructure that contributes positively to the fiscal stance. The government assists these entities to access financing and provides guarantees as needed. Evidently, for several years the largest entities have been investing in key economic infrastructure necessary to support long-term economic growth. Also, during the recent recession, these infrastructure investments helped to stimulate the economy (Miruka, Mukuddem-Petersen & Meniago 2013).

2.2 Fiscal sustainability

We reiterate here that the core contribution of the present study will be the use of a new methodology since most of the literature reviewed here had been deployed in Miruka, Mukuddem-Petersen & Meniago (2013). As we showed in the earlier study, countercyclical fiscal and monetary stance has over the years enabled South African policy makers to support growth and attract both domestic and foreign investments. An inflation-targeting monetary policy has been successful in the pursuit of fiscal consolidation to a great degree yet inequalities and challenges of job creation persist thus necessitating a relook at the fiscal policy given the imperatives of a developmental state. To confound the debt management challenge even further, is the search for appropriate responses to the recent global financial crisis and its aftermath to avoid a crisis similar to what the emerging markets faced in the 1990s and early 2000s.

We are also convinced that South Africa offers an interesting case in fiscal policy management since

the demands of good fiscal governance are embedded in the 1996 constitution. As Ajam & Aron (2007 p.749 – 50) restate, the constitution imposes accountability, transparency and effective financial management in all public budget processes. The National Treasury, which is South Africa's equivalence of the Ministry of Finance in many countries, is thus a creature of the 1996 constitution with an express mandate to implement standard 'accounting practices, classifications and norms to ensure transparency and expenditure control in each sphere of the government, as well as financing the deficit through increased public debt.' Our approach in this study will be to test whether the management of government financial guarantees has lived up to the exacting requirements of the constitution as well as the Public Finance Management Act of 1999 which is the enabling legislation.

South Africa is a constitutional democracy with a three-tier system of government and an independent judiciary. In recent times, the fiscal stance of South Africa and of possible amendments to the stability and growth pact of the country has renewed interest regarding how to measure fiscal sustainability. Determination of whether the country's fiscal stance is sustainable has proved both difficult and highly controversial.

Deviant fiscal behaviour, seen as a signal of unsound economic fundamentals, could be penalised by adverse foreign capital flows. To buttress the point, topical commentators usually use the example of Zimbabwe as a warning to would be transgressors of the Washington Consensus. Having reduced its debt burden over the past thirteen years, the South African government again finds itself facing rising debt. Since 1946, the South African government ran a sustainable fiscal policy, by reducing the primary deficit or increasing the surplus in response to rising debt. Two years before the 2009 recession, South Africa adopted a counter-cyclical fiscal policy stance, which favours expanded public spending during economic slowdowns and vice versa. Fiscal policy thus became expansionary from 2009 onwards and remained so amid the continued weakness in the global economy and the fragile domestic recovery[10].

A review of major studies on South African fiscal sustainability (See, for instance, Hamilton & Viegi 2009; Burger & others 2011; Jibao & others 2011; Lusinyan & Thornton 2011) reveal that the South African government continues to provide support for the economy while ensuring sustainable public finances. Broadly, South African fiscal policy is anchored by three principles: long-term public debt sustainability, counter-cyclicality, and intergenerational equity.

- Sustainability ensures that debt remains under control so that government can continue to borrow at reasonable rates.
- Counter-cyclicality means that spending supports the economy during downturns, even if revenue is insufficient, and the accumulation of debt is reversed to build fiscal space as the economy recovers.
- Intergenerational fairness means the ability to pay for all public services with today's revenues rather than diverting the cost to future generations or denying them of the present available services unless they also share in the benefits of assets created by that spending.

Within this framework, the government has three medium-term objectives: (1) moderating expenditure growth to expand public services at a sustainable pace, (2) Stabilising debt as a share of national income by narrowing the budget deficit and (3) Improving the impact of public spending by prioritising capital investment, and reducing waste and inefficiency[11].

On paper at least, this would seem to be a wise policy move. Nevertheless, there are always other contentions as captured in this letter by former President Thabo Mbeki in his farewell address to the members of the National Executive upon his resignation as reproduced verbatim Reverend Frank Chikane (2012: 64 – 65):

At the same time, I am aware of the reality that there are some in our country who are convinced that such mistakes as we might have made, as well as the reality that in fifteen years we have not eradicated a 350-year legacy of colonialism, as we could not, derive from our strategic commitment to a reactionary, neo-liberal perspective and programme.

In addition, it is also clear that there are different views in our country with regard to the assessment of the objective national and international circumstances within which we have sought to achieve the goals of the democratic revolution.

Still, it can be said with great conviction, that South Africa has overcome adverse initial conditions and achieved a remarkable fiscal transformation over the last decade through adopting durable, credible and well-coordinated reforms as the former President went on to record on the later parts of the same address quoted above.

Lusinyan & Thornton (2009) also concluded that the estimated long-run equilibrium relation between real revenue and spending data in South Africa supports the presence of a weak deficit sustainability condition. Even though the researchers used a number of recently developed unit root and cointegration tests, the very long period considered (1895 – 2005) makes their output of little practical use to policy makers pressurized by transformation imperatives emerging after 1994. Furthermore, their approach of assuming that the fiscal adjustment processes driving the

[10] See, http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/PDF/South%20Africa%20Full%20PDF%20Country%20Note.pdf for more details in this regard.

[11] See also recent annual budget reviews published by the National Treasury such as http://www.treasury.gov.za/documents/national%20budget/2013/review/FullReview.pdf

variables towards equilibrium is linear, is suspect. As Jibao, Schoeman & Naraidoo (2011 p. 3) argue, there is reason to believe that forces driving adjustment towards equilibrium are not always present and of the same strength under all circumstances.

Globalization has meant that small open economies like South Africa have to respond appropriately to potential worldwide financial shocks and this has restricted to some degree fiscal policy discretion. As Ajam & Aron (2007 p. 746) note, globalization 'has created pressures to reform fiscal policy and budgetary systems, and also for policy convergence, including deficit reduction, tax reform to broaden the tax base (while lowering marginal rates), and the restructuring of public sector enterprises. If one also considers the imperatives of a developmental state as well as the challenges of economic transformation, then the onus on public debt managers for prudent governance is challenging indeed. Ajam & Aron (2007: 746) reiterate the standard posit of Public Finance theory to caution that the longer the response to a debt crisis is deferred, the greater and more painful the eventual adjustment needed for solvency.

The question of debt sustainability in South Africa has once again come to the fore given the rising debt occasioned by falling tax revenues since the 2008/09 global financial crisis. This is of interest especially given the fact that South Africa, unlike most advanced economies, has kept her public debt to GDP ratio below 50% since the 1960s (Burger, Stuart, Jooste & Cuevas 2011: 4). Burger, Stuart, Jooste & Cuevas (201: 5) show that the South African public debt to GDP ratio reached its post-apartheid peak in the 1996/97 year when debt service costs reached 15% of revenue to emerge among the largest expenditure items on the government budget.

In one of the most methodologically rigorous studies on fiscal sustainability and the fiscal reaction function in South Africa, Burger, Stuart, Jooste & Cuevas (2011) conclude that there is little risk that sovereign debt might become unsustainable in the near future. The study is especially of interest here because of its methodological rigor. The authors estimated fiscal reaction functions to examine how the South African government has historically reacted to its debt position. They employed the following estimation methods: Ordinary Least Squares (OLS); VAR; General Method of Moments (GMM); and Vector Error-Correction Model (VECM). They catered for non-linearities by employing State-Space and Threshold Autoregressive (TAR) modeling. In summary, all the works considered here gives one hope that the South African fiscal path is sustainable. Nevertheless, the broad questions now need to move into the details of debt composition and the risks associated with contingent liabilities where there is still a huge gap to be covered.

3 Data source and methodology

The study uses time series quarterly data from December 1997 to December 2011, obtained from the South African Reserve Bank (SARB). We use two main variables being (1) Total national net loan debt as percentage of GDP (NND) and (2) Financial Guarantees to GDP Ratio (FG) were in percentage of GDP.

3.1 Methodological framework for data analysis

This study makes use of the time series data analysis estimation technique to study the relationship between the ratio of total national net loan debt to GDP and the ratio of financial Guarantees to GDP. The estimated model is given as:

$$InFG_t = \beta_0 + \beta_1 InNND_t + \varepsilon_t \qquad (1)$$

3.1.1 Stationarity tests

In a time series analysis, estimating equation (1) using the ordinary least squares regression might provide a spurious regression if the data series are non-stationary. If the data is stationary, it means the mean and the variance are constant over time and the value of covariance between two time periods depends only on the distance between the two time periods and not the actual time at which the covariance is computed. To test for stationarity, three popular procedures are usually used. The Augmented Dickey Fuller (ADF), Phillips-Perron (PP), and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests.

Assuming that the series follows an AR (p) process the ADF test makes a parametric correction and controls for the higher order correlation by adding the lagged difference terms of the dependent variable to the right hand side of equation (1).

$$\Delta FG_t = \alpha + \delta FG_{t-1} + \sum_{i=1}^{n} \lambda \Delta FG_{t-i} + \varepsilon_t \qquad (2)$$

$$\Delta FG_t = \alpha + \delta NND_{t-1} + \lambda FG_{t-1} + \varepsilon_t \qquad (3)$$

However, since the ADF test is often criticized for low power, the unit root test has been complement with PP test which adopts a non parametric method for controlling higher order serial correlation in the series. In both ADF test and PP test the null hypothesis is that data set being tested has unit root. Another limitation of the ADF test is that it cannot distinguish between unit root and near unit root process. Thus, we perform a robustness check for stationary using the KPSS test where the null hypothesis is that the data series is stationary against the alternative of a unit root[12].

[12] See a similar approach by Naik, P. K. & Padhi, P. (2012) 'The impact of microeconomic fundamentals on stock prices revisited,' *Eurasian Journal of Business and Economics,* 5(10), pp. 25 – 44.

3.1.2 Cointegration tests

The unit root tests also provide the order of integration of the time series variables. Once the order of integration of the variables is established, we test for cointegration between variables using Engle Granger two step procedure. This helps to check whether the relationship between the variables is empirically meaningful in the long-run. In a multivariate context such as equation (1) above, if the variables under consideration are found to be I(1) (i.e. they are non-stationary at level but stationary at first difference), but the linear combination of the integrated variables is I(0), then the variables are said to be co-integrated (Enders, 2004). With the non-stationary series, co-integration analysis is used to examine whether there is any long run relationship exists. However, a necessary condition for the use of co-integration technique is that the variable under consideration must be integrated in the same order and the linear combinations of the integrated variables are free from unit root. Engel and Granger (1987), if the variables are found to be co-integrated, they would not drift apart over-time and the long run combination amongst the non-stationary variables can be established.

To conduct the co-integration test, three common approaches can be used. The Engel and Granger (1987) or the Johansen and Juselius (1990) or the Johansen (1991) approach can be used. The Engel-Granger two step approaches can only deal with one linear combination of variables that is stationary. In a multivariate practice, however, more than one stable linear combination may exist. The Johansen's cointegration method is regarded as full information maximum likelihood method that allows for testing co-integration in a whole system of equations.

The Johansen methods of co-integration can be written as the following vector autoregressive framework of order *p*.

$$Y_t = \alpha + \sum_{i=1}^{n} \lambda_i Y_{t-i} + \varepsilon_t \quad (4)$$

Where, Y_t is an $n \times 1$ vector of non stationary I(1) variables, α is an $n \times 1$ vector of constants, p is the maximum lag length, λ_i is an $n \times n$ matrix of coefficient and ε_t is a $n \times 1$ vector of white noise terms.

3.1.3 Vector error correction model (VECM)

To use the Johansen's method, equation (4) needs to be turned into a vector error correction model (VECM) which can be written as:

$$\Delta Y_t = \alpha + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-i} + \Pi Y_{t-p} + \varepsilon_t \quad (5)$$

Where Δ is the first difference operator; $\Gamma_i = -\sum_{j=i+1}^{p} \lambda_i$ *and* $\Pi = -I + \sum_{j=i+1}^{p} \lambda_i$ and I is an n×n identity matrix. The test for co-integration between the variables is calculated by observing the rank of the Π matrix via its eigen-values. The rank of a matrix is equal to the number of its characteristic roots that are different from zero. The hypothesis is $H_0 : \Pi = \alpha\beta'$ where α and β are $n \times r$ loading matrices of eigenvectors. The matrix β gives the co-integration vectors, while α is known as the adjustment parameters that gives the amount of each co-integration entering each equation of the VECM.

The aim of this study is to test the number of *r* co-integrating vectors such as *β1, β2, …… βr* . The number of characteristic roots can be tested by considering the following *trace* statistic and the maximum eigen-value test.

$$\lambda_{trace}(r) = -T \sum_{j=i+1}^{p} \ln\left(1 - \hat{\lambda}_i\right) \; and \; \lambda_{\max}\left(r, r+1\right) = -T + \ln\left(1 - \hat{\lambda}_{r+1}\right) \quad (6)$$

Where, *r* is the number of co-integrating vectors under the null hypothesis, T is the number of usable observations and $\hat{\lambda}_i$ is the estimated value for the *i*th ordered characteristic roots or the eigen-value from the Π matrix. A significantly non-zero eigen-value indicates a significant co-integrating vector. The trace statistics is a joint test where the null hypothesis is that the number of co-integration vectors is less than or equal to *r* against an unspecified general alternative that there are more than *r*. Whereas, the maximum eigen-value statistics test the null hypothesis that the number of cointegrating vectors is less than or equal to *r* against the alternative of *r+1* (Enders, 2004; Brooks,2008).

The VECM is used to find out the short-run dynamics of the model. It overcomes the problems of spurious regression through the use of appropriate differenced variables in order to determine the short term adjustment in the model. The long term components of our variables are to obey equilibrium constraints, while short-run components have a flexible dynamic specification.

4 Results and discussion

The descriptive statistics of the two variables under investigation are presented in table 1.

The standard deviation of LFG is less than that that of LNND, suggesting that the national debt is more volatile than financial guarantees. The values of skewness and kurtosis indicate asymmetric distribution.[13] In addition, the coefficients of Jarque-Bera for both variables are not significant, suggesting that the frequency distribution of the variables is normal.

[13] The distribution is normally distributed if the value of skewness is 0 and of kurtosis is 3.

Table 1. Descriptive statistics

	FG	*NND*
Mean	0.24	34.26
Median	0.21	32.60
Maximum	0.43	48.60
Minimum	0.10	22.30
Std. Dev.	0.10	8.21
Skewness	0.53	0.32
Kurtosis	2.18	1.90
Jarque-Bera	4.20	3.85
Probability	0.12	0.15
Observations	57	57

To test for stationarity of the series, we follow the standard procedure of unit root testing. We employ the ADF test and obtain results as presented in the first column of table 2. However, one of the major criticisms of ADF in the literature is that it has low power (for example see, Cochrane, 1991). Hence, we check for robustness of our results by using the PP and the KPSS tests as indicated in the second and third columns respectively. The results considered 5% level of significance in deciding whether to reject or accept the null hypothesis.

Table 2. Unit root tests for stationarity

Variables	*ADF Test*	*PP test*	*KPSS Test*	*Order of integration*
	Ho: Variable is non-stationary	*Ho: Variable is non-stationary*	*Ho: Variable is stationary*	
LFG	-1.873	-1.834	0.748***	
D(LFG)	-6.332***	-6.347***	0.359	I(1)
LNND	-1.691	-1.154	0.751***	
D(LNND)	-1.224	-1.255	0.201	
DD(LNND)	-4.671***	-4.327***	0.343	I(2)
Asymptotic critical values				
1%	-3.555	-3.553	0.739	
5%	-2.916	-2.915	0.463	
10%	-2.596	-2.595	0.347	

Note: Reject Null hypothesis at 10 %(*), 5 %(**), 1 %(***) significant level

The results reveal that LFG is non-stationary at level with intercept, but becomes stationary after first difference at all levels of significance. This suggests that the series is integrated of order 1, I(1). However, the results also reveal that LNND only becomes stationary after second difference, suggesting that the series is integrated of order 2, I(2).

To test for cointegration, we use the Engel and Granger's two step procedure and the Johansen cointegration test for robustness checks. However, we first chose the optimal lag order. According to LR, FPE and AIC we should use maximum 7 lags, but the SC and the HQ shows that we should use the maximum 2 lags. We therefore use 7 lags as our optimum leg length.

Table 3. VAR lag order selection criteria

Lag	*LogL*	*LR*	*FPE*	*AIC*	*SC*	*HQ*
0	-81.62639	NA	0.140998	3.716728	3.797025	3.746662
1	19.21137	188.2305	0.001906	-0.587172	-0.346283*	-0.497371*
2	23.56298	7.736208	0.001880	-0.602799	-0.201319	-0.453131
3	23.77895	0.364748	0.002231	-0.434620	0.127453	-0.225085
4	25.35088	2.515086	0.002500	-0.326706	0.395959	-0.057304
5	33.01733	11.58485	0.002144	-0.489659	0.393598	-0.160390
6	35.37577	3.354235	0.002338	-0.416701	0.627148	-0.027564
7	45.13063	13.00648*	0.001845*	-0.672473*	0.531969	-0.223469
8	48.10127	3.696789	0.001982	-0.626723	0.738311	-0.117852
9	53.07949	5.752617	0.001963	-0.670200	0.855426	-0.101462
10	56.47809	3.625166	0.002107	-0.643470	1.042748	-0.014865
11	58.10961	1.595263	0.002475	-0.538205	1.308606	0.150268
12	59.79742	1.500276	0.002944	-0.435441	1.571962	0.312899

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

We then test for cointegration. In using the Engle Granger cointegration two step procedure, the first step invole running the regression, which produce the following cointegrating equation:

$$LnFG_t = 2.69387 - 1.201834\, InNND_t + \varepsilon_t \quad (7)$$

Where $\varepsilon_r = LnFG_t + 1.201834\, InNND_t + 2.69387$

The second step involved testing for units roots in ε, we got the following result for both the ADF and PP as follows:

Table 4. Unit root test of time series with ADF and PP tests (at intercept only)

	ADF TEST			***P.P TEST***			
Variables	***t-values (lags)***	***5% critical value***	***SIC***	***t-values (Bandwidth)***	***5% critical value***	***SIC***	***Order of integration***
ε_t	-4.452361	-2.915522	-1.28825	-4.526903	-2.9155	-1.28825	I(1)

Note: Reject at 10 %(*), 5 %(**), 1 %(***) significant level

The results based on the Engle Granger cointegration test suggest that the residuals are stationary at first differences. The results suggest that there is no long run relationship between our variables. This is because the residuals are integrated to the same order as FG. However, due to the weaknesses that have been much discussed in the literature (for example, Sjo, 2008), we also perform the Johansen cointegration test.

Table 5. Johansen cointegration test

Hypothesised no. of CE (s)	***Trace statistics***	***0.05 Critical value***	***Probability*****	***Max-eigen statistics***	***0.05 Critical value***	***Probability*****
None*	30.97704	15.49471	0.0001	17.47290	14.26460	0.0150
At most 1*	13.50415	3.841466	0.0002	13.50415	3.841466	0.0002

Note: *denotes rejection at the 0.05level, **MacKinnon-Haug-Michelis (1999) p-values

The trace and maximum eigen value statistics identify two cointegrating vectors. However, this result yields a different result to the result obtained the ADF two step procedure. Therefore we conclude that there is no cointegration between FG and NND.

We proceed to analyse the short-run relationship through the ECM. The results show that the error correction term, ECT (-1) is significant, the estimate of the equation is theoretically correct since the sign of the ECT is negative and with a high absolute t-statistics value of -0.530704. In the short run, the coefficient of changes in the previous period of D(LFG) is positive and insignificant while D(LFG) and D(LNND) at lag one and two are significant in determining D(LFG). D(LFG(-2) and D(LNND(-1) are negatively related to D(LFG) while D(LFG(-1), D(LNND), D(LNND(-2)) are positively related to D(LFG). R square is 0.109979 and Adjusted R square is -0.003641. The regression is spurious hence confirming the cointegration results that there is no long run relationship between LFG and LNND.

After the error correction model, we examined if the model was well specified. Results of the summary of diagnostic tests are presented in tables 4. Therefore, we conclude that although there is no long run relationship, the regression model was good and well specified.

Table 6. The summary of diagnostics and stability tests

Tests	***H_0***	***Test Statistics***	***P-Value***	***Conclusion***
Breuch-Godfrey LM test	No serial correlation	nR^2=1.078183	0.5833	There is no serial correlation
WHITE	No heteroskedasticity	nR^2=13.15439	0.9882	There is no heteroskedasticity
RESET test(stability)	Misspecification of model	F=02.515056	0.1196	The model is not misspecified

The results from the Autoregressive distributed lag model indicate that the past value of LFG is significantly affect its present value positively. A 1% increase in the pass value of LFG will cause LFG to increase by 99.0664%. LNND does not significantly affect LFG, hence the pass value LFG significantly affects it present value of LFG.

Since cointegration does not mean causation, our result shows that LNND does not Granger cause LFG but LFG Granger causes LNND at a 5 % level of significance as shown in the Table 4 below. As such,

we reject the null hypothesis and accept the alternative. This result implies that, changes to LFG affect LNND but changes in LNND will not affect LFG. The causality is unidirectional, from LFG to LNND. This means that the past values of LFG have a predictive ability in determining the present value of LNND while the past value of LNND does not have a predictive ability in determining LFG. The implication of these results is that, LFG should be targeted first. This is because by targeting LFG, it will affect LNND.

Table 7. Results on granger causality

Null Hypothesis	*Observations*	*F Statistics*	*Probability*
LNND does not Granger Cause LFG		0.88551	0.4189
LFG does not Granger Cause LNND	55	4.49949	0.0160

4 Conclusion

This study examined the impact of financial guarantees on debt sustainability in South Africa. The results reveal that although there is no long-run relationship between the two variables, the pass value of financial guarantees significantly affects it present value. Also, the past value of financial guarantees has a predictive ability in determining the present value of debt sustainability. These findings may be contrary to what would be expected in the case of South Africa considering that the country is managing the issuance of financial guarantees prudently and that at present levels, there is no need for a radical policy shift.

Nevertheless, given the populist demands regarding the management not only of state-owned enterprises but the role of the state in the economy, we need to keep a watchful eye lest the temptation proves too great and caution is thrown to the wind. Like with any other country, the challenge for South Africa is to continually devise ways of increasing social as well as infrastructure expenditure at a sustainable rate and to enhance the quality of service delivery, to avoid undermining the impressive fiscal stability gains at the macroeconomic level and ensure continued inclusive prosperity.

References

1. Ajam, T. & Janine, A. 92007) 'Fiscal renaissance in a democratic South Africa, *Journal of African Economies*, Vol. 16, Issue No. 5, pp. 745 – 781.
2. Ajam, T. &Aron, J. (2007) 'Fiscal Renaissance in a Democratic South Africa', *Journal of African Economies*, vol. 16, no. 5, pp. 745 – 781.
3. Aron, J and Muellbauer, J (2005) 'Monetary policy, macro-stability and growth: South Africa's recent experience and lessons', *World Economics* 6 (4): 123-147, December.
4. Bajo, A. & Primorac, M. (2011) 'Government guarantees and public debt in Croatia,' *Financial Theory and Practice*, vol. 35, no. 3, pp. 253 – 276.
5. Braşoveanu-Obreja, L. And Braşoveanu, V.I. (2012). "Fiscal adjustment-strategies and consequences: empirical evidence for European Union Economies", CIGE Working Papers, no.28/2012.
6. Burger, P., Stuart, I., Jooste, C. & Cuevas, A. (2011) *Fiscal Sustainability and the Fiscal Reaction Function for South Africa*, IMF Working Paper WP/11/69
7. Calitz, E. (2000) 'Fiscal implications of the economic globalisation of South Africa,' *Journal of African Economies*, Vol. 9 (2): 189-212
8. Campeanu, E. (2011) *Importance of Fiscal and Budgetary Policies in the Economy, Theoretical and Applied Economics, Supplement*. 11th International Conference Financial and Monetary Stability in Emerging Countries, December 10-11, 2010.
9. Campeanu, E. & Gyorgy, A. (2009) *Public Debt Dynamics in European Union Member States in the Context of Globalization Challenges*. 16th International Economic Conference-IECS 2009, May 2009, Sibiu, Romania, pp.108-118.
10. Chikane, F. (2012) *Eight days in September: the removal of Thabo Mbeki*, Johannesburg: Picador Africa.
11. Fielding, D. (2000) 'Investment Under Credit Rationing and Uncertainty: Evidence from South Africa,' *Journal of African Economies*, 9 (2): 189-212.
12. Hamilton, L. & Viegi, N. (2009) 'Debt, democracy and representation in South ,' *Representation*, Vol. 45, Issue No. 2, pp. 193 – 212.
13. Jacobs, D., Schoeman, N. & van Heerden, J. (2002) 'Alternative definitions of the budget deficit and its impact on the sustainability of fiscal policy in South Africa', *South African Journal of Economics*, vol. 70, no. 3, pp. 251 – 257.
14. Jibao, S. S., Schoeman, N. & Naraidoo, R. (2011) 'Fiscal regime changes and the sustainability of fiscal imbalance in South Africa; a smooth transition error-correction approach', working paper no. 228, Department of Economics, University of Pretoria, Pretoria.
15. Lusinyan, L. & Thornton, J. (2009) 'The sustainability of South African fiscal policy: an historical perspective', *Applied Economics*, vol. 41, pp. 859 – 868.
16. Miruka, C. O., Mukuddem-Petersen, J & Meniago, C. (2013) 'Financial Guarantees and Other Fiscal Risks in South Africa: An Econometric Approach', Chapter 8: Economics of Debt. Series: Economic Issues, Problems and Perspectives; Global Economic Studies. Editor: Mark A. Petersen. Nova Science Publishers, New York, 2013, pp. 171 – 196, ISBN: 978-1-62618-792-4.
17. Naik, P. K. & Padhi, P. (2012) 'The impact of microeconomic fundamentals on stock prices revisited: evidence from Indian data,' *Eurasian Journal of Business and Economics*, Vol. 5, Issue No. 10, pp. 25 – 44.
18. Polackova, H. (1998) *Contingent government liabilities: a hidden risk for fiscal stability*, Policy Research Working Paper Series No. 1989: The World Bank.

19. Raduelescu, A. (2012) The public debt of countries from euro zone - The snowball effect, Financial Studies 3/2012, pp.95-103.
20. Tshiswaka-Kashala, G. (2006) 'Is fiscal policy sustainable in South Africa? An application of the econometric approach,' Working Paper Series No. 2006 – 14, University of Pretoria, Department of Economics (online). Available: http://web.up.ac.za/UserFiles/WP_2006_14.pdf. Date accessed: 9 May 2014.
21. Winpenny, J. (2006) 'Guaranteeing development: the impact of financial guarantees,' A study for the OECD Development Centre (online). Available: http://financeguide.euwi.net/files/euwi/Rachel%20Cardone_tmpphpLoPEjg.doc. Date accessed: 9 May 2014.