The Debt and Fiscal Nexus in Barbados: A Fiscal Policy Reaction Analysis

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Abstract

The sustainability of public debt in Barbados has received significant and increasing attention over the past decade. Most of the research in this area has focused on Central Government debt as indicated by various thresholds and co-integration analyses of revenue and expenditure. These papers have found, in general, that Central Government debt is on a sustainable path. However, much less empirical investigation has been applied to the explicit fiscal policy responses to rising debt. This study therefore tests government's fiscal policy reactions to changes in the level of central government debt. Furthermore, given the unique risks associated with contingent liabilities, whether Barbados' fiscal policy systematically respondsto adjustments in total Government debt is assessed. Using dynamic co-integration and state space modeling frameworks, support is found for the notion that Barbados has pursued sustainable fiscal policy since 1975. However, the declining strength of the fiscal response suggests that the authorities need to focus on raising the non-interest budget balance if the level of debt is to be sustainable in a practical sense.

Keywords:Fiscal policies, Public Debt, Dynamic OLS, State space models
JEL Classification:*H30, H63, C22*

Introduction

The growing body of research on the debt sustainability position in Barbados has generated somewhat mixed results. In general however, the findings suggest that the island's debt path is sustainable. Nevertheless, recent downgrades by leading ratings agencies have raised questions about Barbados' ability to meet its credit obligations. These developments indicate that Barbados' debt position and its fiscal approach to debt may warrant further and more detailed investigation. As such, this paper assesses whether Barbados' fiscal policy responds systematically to changes in the level of sovereign debt under the proposition that rising debt requires higher levels of primary surpluses in the long-run to ensure debt and fiscal sustainability.

Moreover, given the different risk profiles associated with on-budget debt and those liabilities ofthe private sector and quasi-government agencies for which government stands as guarantor, the focusof this paper is widened toinclude contingent liabilities to determine whether government adjusts its fiscal policy to movements in the broader measure of debt.

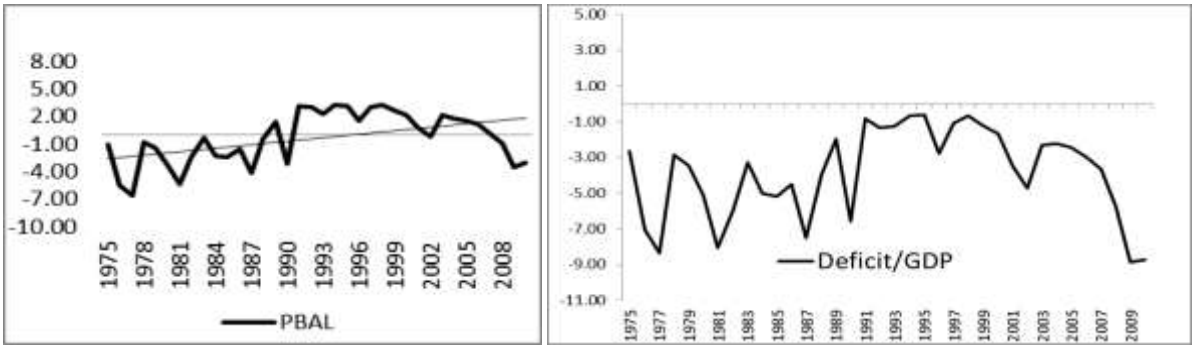
Thestudy proceeds as follows:the next section presents some stylized facts about Barbados' debt and fiscal evolution. Section 3reviews the theoretical and empirical literature. Sections 4 and 5 describe the methodological approach and explainthe results. In section6, concluding remarks are provided.

2. Barbados Government Operations and Debt: Stylized Facts

As there have been a number of recent and detailed exposés of Barbados fiscal and debt evolution (see Anyadike-Daynes, 1991; Archibald and Greenidge, 2002; Worrell et al., 2011), the aim of this section is to give a very brief summary of the island fiscal and debtdynamics over the last three decades. Like many of its neighbours in the Caribbean, persistent deficits have dominated Barbados central government operations during this review

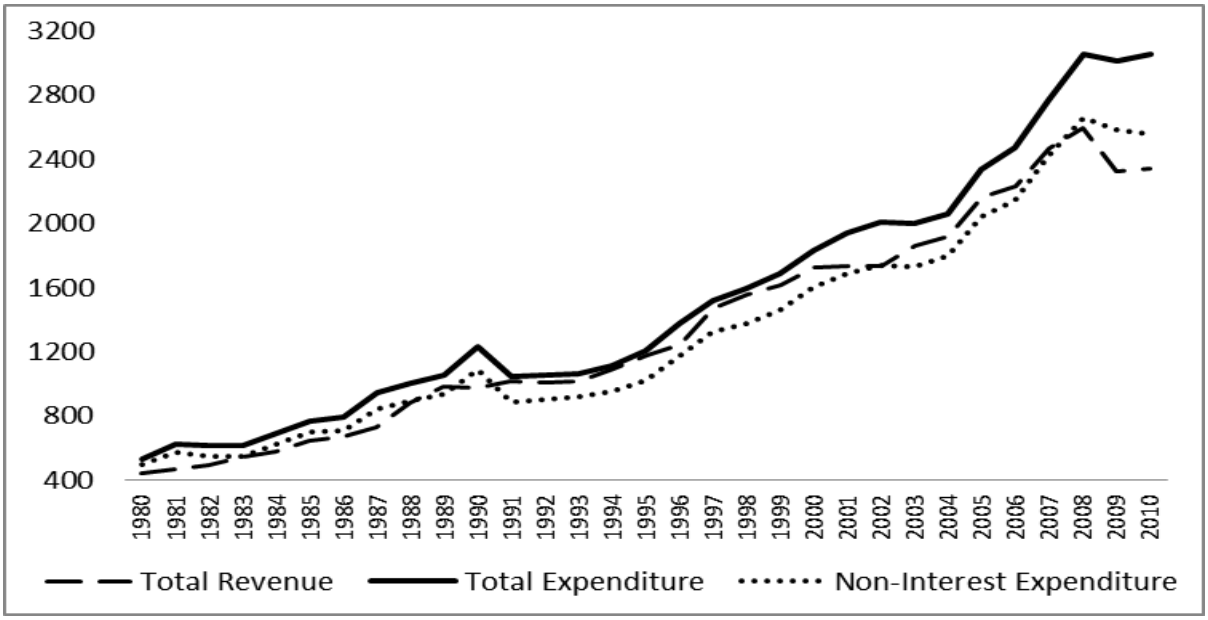
period. The fiscal year (FY) deficits have swelled from around $21.6 million in 1975 toabove $700 million by 2010. However, as a percentage of gross domestic product (GDP) the expansionhas been much less dramatic, with the ratio moving from just under 1% to 3% over the same era.

Figure 1: Primary Balance to GDP and Total Deficit to GDP Ratios



Government's primary fiscal balance, the difference between revenue and non-interest expenditure, has been much more volatile over the period under investigation. As Figure 2 illustrates, the primary balance varied widely over the early part of the period, though it remained negative in virtually every year up to 1991. Subsequently, improvements in revenue and spending restraint ensured that the primary balance was positive up to 2007.

Figure 2: Total Expenditure, Non-interest Expenditure and Total Revenue



In the decade prior to 1991, non-interest expenditures were persistently above total revenues. Average growth in revenues was almost exactly matched by that of average non-interest spending, making it difficult to close the primary gap during this time.

In 1991, the country faced a foreign exchange crisis and, under the aegis of an International Monetary Fund (IMF) stabilisation arrangement, a series of fiscal consolidation measures were pursued, including an 18% cut in non-interest expense. This resulted in what was the first and one of the largest primary surpluses for the review period. Afterward the primary balance continued to fluctuate as narrowing surpluses in one period were often met with higher surpluses in following years. The primary balance generally remained in surplus until 2008 – the onset of the global crisis – when it reverted to a FY deficit.

Nevertheless, due to the rising level of debt, once interest payments are taken into account (Panel 2, Figure 1) it becomes clear that Barbados has recorded persistent deficits on its overall fiscal accounts. As a result, the country's debt as a ratio to GDP has grown substantially since 1975.

At this point, a useful distinction should be made. The "total debt" or "debt ratio" referred to thus far (and indeed in the papers discussed in the following section) has been Gross Central Governmentdebt (GCGD). While this measure is critical both for economic analysis and policy-making, it fails to account for contingent liabilities. Broadly speaking, contingent liabilities are obligations that arise from a particular, discrete event(s) that may or may not occur (IMF, 2003). Put simply, contingent liabilities primarily represent claims which become payable by the Central Government given that some contractual condition has been met. These explicit contingent liabilities occur principally from loan and other payment guarantees where Government contracts to bear the risk of non-payment by another party, either a public or private entity. While guarantors (in this case, Central Government) are only liable for payment if the debtor defaults, by providing these explicit guarantees, the guarantor

becomes exposed to all of the risks associated with the debt, including roll-over risk and market risk. The IMF (2003) further notes that these types of guarantees expose Governments to regulatory or policy risk in which "implementation of certain laws and regulations is critical to the financial performance of the debtor" (p. 84).

Depending on the size and composition of these guarantees, the attendant risks can be substantial. Furthermore, the extent to which the debtor is likely to be able to meet the obligations is also a critical consideration since it has major implications for future fiscal stability via its impact on interest costs and amortization expenditure. In light of this, the World Bank (1998) has proposed that fiscal adjustments that narrowly target deficit and debt reduction do not necessarily prevent fiscal instability. Consequently, any comprehensive study of a nation's fiscal standing has been found to be"incomplete if it skips over obligationsmade by the government outside the budget" (World Bank, 1998; p 1).

Figure 3: Government and Government Guaranteed Debt

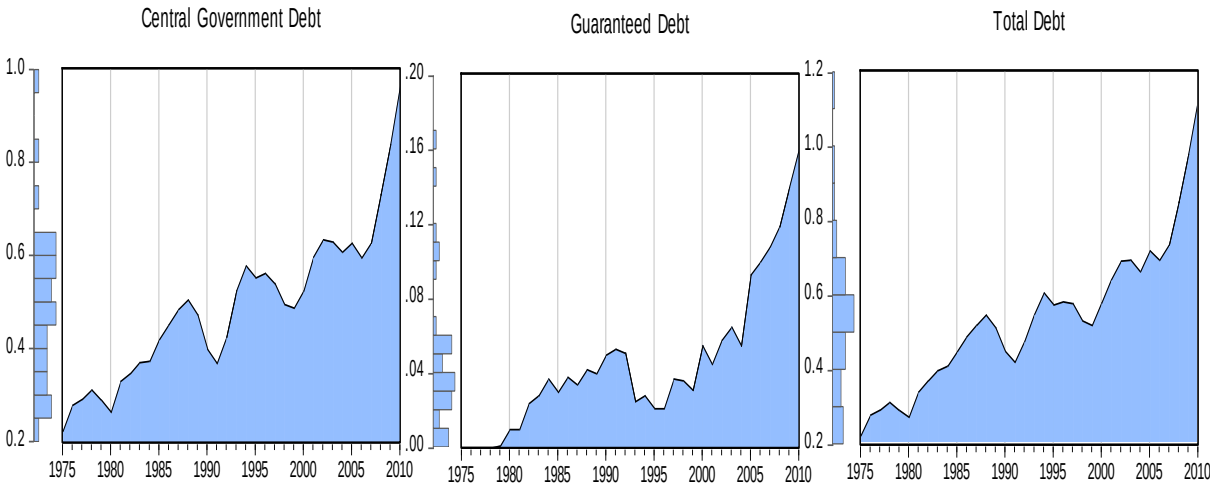


Figure 3 confirms that the path of guaranteed debt has mirrored that of central government debt, albeit at much lower levels when represented as a ratio to GDP. Despite growing gradually throughout the 1980s, guaranteed debt remained just below 5% of GDP up to 1990, before falling following the 1991 to 1992 crisis episode. This drop was likely due to a net shift in debt from cash-strapped statutory bodies to Central Government, a view which

is supported by a large increase in government debt in 1993.The expansion in guaranteed debt continuedthroughout the 1990s, under 5% of GDP prior to 1990, guaranteed debt rose dramatically post-2000, moving from 4.4% of GDP in 2001 to 10.7% in 2007 and 16% by 2010.

While there is a paucity of relevant historical data, the increase in contingent liabilities since 2000 has contributed to the rise in overall debt. Between 2005 and 2010 alone, contingent liabilities transferred to government were the equivalent of 7.5% of estimated GDP. The trajectory of these contingent liabilities suggests that the risk posed by this type of off-budget financing should form an integral part of any analysis of fiscal sustainability and should be accounted for in prudent debt management strategy.

3. Literature Review

Various works have tested debt and fiscal sustainability using stationarity and co-integration analysis. The early research (Hamilton and Flavin, 1984; Kremers, 1988) focused principally on the stationarity of primary balances and debt stocks under the present value constraint (PVC) postulation that stationarity of these series is indicative of sustainability and found mixed results for the United States (U.S.). In particular, by employing similar methodologies but varying lag lengths, Hamilton and Flavin (1984) and Kremers (1988) found divergent results for the debt-to-GDP ratio in the U.S., the former concluding that debt is sustainable and the latter supporting an unsustainable debt position.

Building on these early articles, Trehan and Walsh (1988,1991) extend the analysis to instances where the primary balance or the debt ratio are non-stationary, suggesting that if the former is stationary and the latter is not, then the fiscal position is unsustainable. Applying this approach to the U.S., they found support for Kremer's earlier study as they could not reject the proposition that the debt was unsustainable.

Another strand of research still based on the PVC has been pioneered by Barro (1979; 1986) and Bohn (1998), who examine sustainability through the response of debt and fiscal policy to past changes in the level of government indebtedness.More specifically, these authors argue that a positive reaction of the primary surplus to increases in the debt ratio conveys reliable information about fiscal sustainability in spite of how interest rates and growth rates compare (Agènor et al., 2000).What is perhaps even more critical is thatthe approaches of Barro and Bohn focus onthe importance of controlling for cyclical fluctuations in spending and output in determining fiscal sustainability. By explicitly accounting for these fluctuations, both authors found support for the sustainability of debt in the U.S. Thismethod is of particular relevance for developing countries such as Barbados which tend to experience greater levels of macroeconomic volatility than their developed counterparts.

As a result of its usefulness, similar fiscal policy response functions have been widely employed in analysing fiscal sustainability in developing countries. De Mello (2008), for instance, appliedsuch an error-correction model toBrazil and concluded that fiscal policy reacted positively to changes in the level of debt. Sanchez-Fung and Ghatak (2007), in their survey of Peru, the Philippines, South Africa, Thailand and Venezuela, provided evidence of fiscal sustainability in these economies, albeit weak.

Although thefiscal policy response approach has not been undertakenexplicitly on Barbados, a variety of other research has been conducted on the sustainability of Barbados' debt.Table 1 summarises some of the more recent studies on Barbados, the results of which generally support the notion of both fiscal and debt sustainability. Particularly noteworthy is that while the general conclusions have been relatively consistent, the findings appear to be quite sensitive to the empirical approach and theoretical basis used in their derivation. For example, in her examination of primary deficits, Drakes (2008) utilised a policy function augmented by ARIMA forecasts to produce a sustainable debt outlook for Barbados and

found a threshold to be 80% of GDP. Worrell et al (2011), who employed a deterministic model to examine sustainability through the impact of seinorage on foreign exchange reserves, concluded that fiscal deficits have been sustainable since 2008, despite a debt ratio in excess of 90%. This underscores the need for continued analysis of debt and fiscal sustainability dynamics.

Table 1: Literature on Debt in Barbados

Author	Data/Variables	Methodology	Conclusions
Craigwell et al (1988)	External Debt, GDP Gap, interest rates, balance of payments, expenditure gap,	Ordinary Least Squares used to identify the determinants of External Central Government Debt	Losses in output, external imbalances and unusually large government expenditure were significant determinants of changes in the level of Barbados' external public debt
Drakes (2008)	Gross Central Government Debt to GDP; Output Per Capita; Inflation; Primary Surplus to GDP; Trade Openness Measure	Dynamic Ordinary Least Squares, ARIMA Forecastingused to predict a sustainable level of Central Government Debt	Positive relationship between surplus and debt, indicating sustainability. Current debt was below the calculated sustainable thresholds, further indicating sustainability of the debt.
Archibald and Greenidge (2002)	GDP Growth; Central Government Debt; Revenue and Expenditure; Inflation; Real Interest Rates; Central Government Primary Balance	Accounting Approach to the Primary Gap Indicator, Co-Integration Analysis of Central Government Debt	Debt is sustainable given the excess of the primary balance over that required to stabilise the debt ratio. This was confirmed by the observed co-integrating relationship between government expenditure and revenue.
Greenidge et al (2010)	External Debt; Output Gap; Expenditure Gap; Real Effective Exchange Rates; US Real Interest Rates (Proxy For Cost Of Borrowing); Domestic Exports	Dynamic Ordinary Least Squares used to identify the determinants of External Central Government Debt	A Barro-type approach was used to examine the determinants of external debt. Pooled results indicate that both the income and expenditure gaps are critical in determining the level of external debt
Worrell et al (2010)	Foreign Exchange Reserves; Central Bank Credit To Government;	Non-Stochastic Model Of The Impact Of Seinorage Financing On Reserves	Given the level of reserve, import reserve cover was sufficient under a range of debt scenarios, pointing to sustainability in terms of the impact of domestic financing on reserves. The authors conclude that since 1993 fiscal deficits have been sustainable despite considerable rises in debt ratio.

4. Empirical Model, Data and Methodology

4.1 Empirical Model

The approach followed in the empirical analysis is derived from Bohn and Barro's measures of sustainability. Bohn (1998) acknowledges that persistent growth in the debt-to-GDP ratio over time is indicative of an unsustainable position.However, he argues that the traditional tests of the growth of the debt ratio, which rely on univariate stationarity analysis, are misleading because these models are misspecified. He supports this argument by pointing to Barro (1986)'s tax smoothing theory in which governments attempt to minimise the economic costs of tax collections by smoothing marginal tax rates over time. Under the tax smoothing hypothesis, optimal tax policy is dependent only on permanent government spending and the level of debt (Bohn, 1998). Therefore, by failing to account for deviations in government spending from their long-run trends, Bohn argues that unit root tests suffer from omitted variable bias and can therefore lead to erroneous conclusions when used to evaluate debt dynamics.As such, Barro(1979, 1986) proposes testing the system:

$$\Delta d_t = \alpha_0 + \alpha_1 d_{t-1} + \alpha_3 YVAR + a_4 GVAR + \varepsilon_t \qquad (1)$$

whered_t represents the ratio of debt to GDP, $\Delta$is the difference operator, *YVAR* and *GVAR*are cyclical deviations of income and government expenditure from historical trends and $\varepsilon_t$is the white noise error term.*YVAR* is calculated as:

$$YVAR = \left(1 - \frac{y_t}{y_t^*}\right) * \left(\frac{g^*}{y_t}\right)$$

wherey_t and y^* measure real GDP and trend GDP, respectively. Similarly, g^* represents trend real government expenditure. The first term on the right hand side implies that a negative shock to output (falling y_t) leads to an increasedlevel of debt through reduced tax revenues (providing that government does not raise taxes in the short-run). Furthermore, the second term on the right hand is expected to change very little, but imposes a "penalty" during

periods when expenditure trends upward. In other words, revenue losses and the subsequent impact on debt are the product of movements in output as well as the "normal" level of government spending. If the latter expands, the effect of contracting output (decreased tax revenues) is exacerbated by higher trend expenditure. Under the tax smoothing approach, this variable is expected to be positively signed.

GVAR is computed as:

$$GVAR = \frac{(g_t - g_t^*)}{y_t}$$

where the variables are as defined above. Again, *GVAR* relies on the tax smoothing theory in which government will not adjust taxes during periods of high expenditure, but will instead raise the level of debt. As with *YVAR*, the expectation is for this variable to be positively signed, as greater levels of expenditure (in the absence of higher taxes) will result in increased levels of debt.Following from this, Bohn (1998) indicates that a similar view can be taken of the primary balance. He argues again that unit root tests of primary balances are inherently biased, as they fail to account for the crucial variables outlined above. In other words, Bohn suggests testing the following model:

$$s_t = \rho * d_{t-1} + \alpha Z + \varepsilon_t \Rightarrow \rho * d_t + \upsilon$$

wheres_t represents the primary surplus, Z is a vector of control variables and the other variables are defined as before. Bohn's model, which speaks directly to the response of the fiscal balance to changes in debt, can be operationalized as:

$$s_t = \alpha_0 + \alpha_1 d_{t-1} + \alpha_3 YVAR + a_4 GVAR + \varepsilon_t \qquad (2)$$

The *a priori* of theparameter on the *GVAR* variable in this system is intuitive: spending in excess of trend (*g**) is likely to have a negative impact on the primary fiscal position. Given its formulation, positive deviations in output from trend will have a direct effect on the fiscal position and will result in a negative coefficient for *YVAR*. Since higher output is expected to

improve revenues and fiscal balances, this variable is anticipated to carry a negative sign in estimating Equation (2).

Both Equations (1) and (2) are modified with a dummy variable (*DUMMY)* to account for the structural break in the series following the stabilisation adjustment in 1991 discussed in the previous section.

The main test employed in this paper (Equation 2) looks specifically at the non-interest fiscal balance because real interest payments represent that portion of government expenditure which is related to the level of debt, but over which government has limited control. Therefore, by examining the response of the primary balance meaningful inferences about fiscal dynamics and the understanding of how government's budgeting react to changes in its level of indebtedness can be made. If the response is positive, it may be concluded that governments have pursued policies that are consistent with long-term fiscal sustainability.

4.2. Data

To estimate Equations (1) and (2) above annual data obtained from the Central Bank of Barbados for the period 1975 to 2010 is employed. The variables used and their representations in the testing equations are shown in Table 2.

Table 2: Data Descriptions and Representations

Variable	**Description**	**Model Representation**
Central GovernmentPrimary Balance	Central Government Revenue less non-interest expenditure as a ratio to GDP	*P_BAL*
Total Government Debt	The sum of Central Government Debt and Government Guaranteed Debt	*TOT_DEB*
Central Government Debt	Total Central Government Debt as a ratio to GDP	*CEN_GOV*

4.3. Econometric Methodology

The two models are estimated using the Dynamic Ordinary Least Squares (DOLS) procedure developed by Saikkonen (1991) and Stock and Watson (1993), particularly because this approach allows for the determination of a long-run relationship among variables that could be either *I(1)* and *I(0)*while taking account of residual autocorrelation and endogeneity of the regressors. Formally, such a model is written as follows:

$$p_t = a_t + x_t'\beta + \sum_{j=-k}^{k} \gamma_j' \Delta x_{t-j}^I + \varepsilon t \qquad (3)$$

wherex^I denotes the sub-set of *I(1)* variables of *x*, β is the vector of long-run coefficients, Δx_{t+j}^I accounts for the possible endogeneity and autocorrelation by introducing leads and lags.

5. Results and Discussion

The first step in the estimation process is to determine the order of integration of the variables using the familiar ADF, PP and KPSS unit root tests (see Table 3). They indicate that the two variables *GVAR* and *YVAR* are *I(0)* while *CEN_GOV, TOT_DEB* and *PBAL* are *I(1).* The non-stationarity of the debt variables (*TOT_DEB* and *CEN_GOV*) is in keeping with the observation by Bohn (1998) regarding the general findings in the literature.

Next, Equations (1) and (2) are estimated using OLS, first with the traditional debt ratio and then using the total debt ratio, incorporating the guaranteed debt. The output of these systems (Tables 4 and 5) is indicative of whether the two measures of debt and fiscal responses are sustainable in the Bohn/Barro sense.

Table 3: Unit Root Test Results

	ADF	PP	KPSS
CEN_GOV	0.593	0.763	**0.819*** **
D(CEN_GOV)	**-3.304** **	**-2.312** **	0.179
P_BAL	-2.564	-2.412	**0.431** **
D(P_BAL)	**-4.103*** **	**-8.912*** **	0.183
TOT_DEB	1.118	1.145	**0.806*** **
D(TOT_DEB)	**-2.617** *	**-2.769** *	0.342
GVAR	**-3.438** **	**-3.565** **	0.074
YVAR	**-4.783*** **	**-2.658** *	0.036

Notes: *,**,*** denotes rejection of the null hypothesis at the 10, 5 and 1% levels, respectively**.** Intercept included in unit root equations.

Table 4: OLS Results of Equation (1)

Dependent Variable: D(CEN_GOV)		Dependent Variable: D(TOT_DEB)	
CEN_GOV(-1)	**0.038013**	**TOT_DEB(-1)**	**0.046945**
	(0.016121)**		(0.014923)***
GVAR	1.042832	GVAR	0.855958
	(0.298585)***		(0.413711)**
YVAR	3.621068	YVAR	2.709388
	(0.696961)***		(0.765075)***
R-squared	0.661103	R-squared	0.603088
Adjusted R-squared	0.57324	Adjusted R-squared	0.518035
S.E. of regression	0.030773	S.E. of regression	0.034012
Log likelihood	76.71764	Log likelihood	72.57914
Durbin-Watson stat	1.460823	Durbin-Watson stat	1.72615

Notes: Heteroskedastic Autocorrelated Consistent standard errors in parentheses. *, **, *** denotes rejection of the null at 10, 5 and 1% levels, respectively.

In line with the *a priori* under the Barro formulation, *YVAR* and *GVAR* enter both systems with the expected positive signs. However, in contrast to the findings of previous authors (see for example …) both debt measures enter their respective equations with coefficients that are positive and statistically significant. Recalling the preceding observation that these results may be sensitive to lag length, the two systems were retested utilizing higher order lags and it was found that the evidence are consistent. As such, it can be concluded that the debt ratios are non-stationary, even after accounting for

cyclicalfluctuations.

Nevertheless, it is important to note here that persistent increases in the debt ratio (its failure to revert to a non-conditional mean) do not, in themselves, suggest un-sustainability. In fact as alluded to earlier the dynamics of the debt ratios are not complete measures of sustainability because rising debt could be countered by future budget surpluses in the long-run. As Roubini (2001) notes, although this may require draconian policies to improve the fiscal position, sustainability should be analysed by considering not just the changes in debt, but the extent to which the fiscal balance adjusts to these movements in the long-run. Therefore, the system proposed in Equation (2) is now examined.

Given the findings for Equation (1) which confirm that the main variables under consideration (CEN_GOV and *TOT_DEB*) are non-stationary in levels, it is difficult to make inferences without accounting for the possibility of a spurious relationship among the variables. As such, Equation 2 is tested in the traditional manner for co-integration. Note that the findings for the two debt indicators are very similar so from here on only the results of TOT_DEB are reported.

The Johansen system and single equation statistics reject the hypothesis of no co-integrated between *PBAL* and *TOT_DEB*(see Table 5).

Table5: Co-integration Test Results

Johansen System Co-integration Test		
Dependent	tau-statistic	z-statistic
TOT_DEB	-2.13695	-13.00503
P_BAL	-4.163325**	-23.41933**
Single Equation Co-integration Test		
Unrestricted Co-integration Rank Test (Trace)		
Hypothesized		
No. of CE(s)	Eigenvalue	
None	0.374248*	
At most 1	0.216397	

Notes: *, **, *** denotes rejection of the null hypothesis at 10, 5 and 1% respectively. Exogenousregressors: *YVAR, GVAR, DUMMY*

Table 6: Long-run Dynamic OLS Results

Dependent Variable: P_BAL	
Long-Run	
TOT_DEB	**0.120276**
	(0.010113)***
YVAR	1.028999
	(0.117454)***
C	-0.04227
	(0.005037)***
Short-Run	-
Dependent Variable: D(P_BAL)	
D(TOT_DEB(-1))	**-0.181906**
	(0.079953)**
D(TOT_DEB(-2))	**-0.143333**
	(0.066973)**
D(P_BAL(-1))	-0.281996
	(0.086837)***
D(P_BAL(-2))	-0.357427
	(0.064461)***
YVAR	-0.696371
	(0.302263)**
YVAR(-1)	1.548107
	(0.403236)***
GVAR	-0.4615
	(0.204809)**
GVAR(-1)	0.569405
	(0.141953)***
ECT(-1)	**-0.342872**
	(0.134446)***
R-squared	0.693823
Adjusted R-squared	0.591763
S.E. of regression	0.014245
Sum squared resid.	0.00487
Log likelihood	98.72462
Durbin-Watson stat	1.897516

Notes: standard errors in parentheses are heteroskedasticity and serial autocorrelation consistent (HAC). *,**. and*** represents statistical significance at 10, 5 and 1% levels, respectively. Automatic leads and lags specification (lead=2 and lag=1 based on AIC criterion, max=3). Additional Regressors: *YVAR, GVAR, DUMMY*.

Next the DOLS model in Equation (3) is estimated to derive the long-run coefficients. These are presented in Table 6. The positive and significant long-run coefficient on the *TOT-DEB* variable suggests that in the long-run the primary balance is in fact reacting sustainably to changes in the combined on-budget debt contingent liabilities. This systematic response

implies that in the long-run, the primary balance is increased to account for the present level of debt, indicating a sustainable fiscal approach.

Following Burger et al. (2011), the evolution of the fiscal policy response is now examined by employing a state space specification in which the coefficient on the TOT_DEB variable is allowed to vary over time. The model was estimated with constant coefficients on the cyclical components of output and government expenditure as well as a constant, allowing only the parameter on the debt variable to fluctuate. The results are displayed in Table 7.

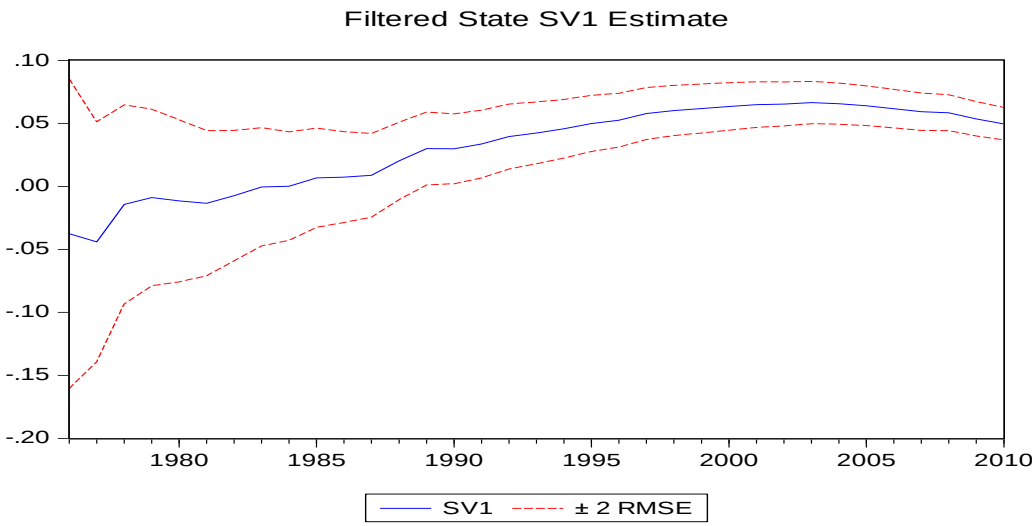
Table 7: State Space Estimation Output

Fixed Coefficient	
YVAR	-1.08069
	(0.460367**)
GVAR	-0.94143
	(0.275879***)
State-Space (End State)	
TOT_DEB	0.049627
	(0.006426***)

The final state of the debt variable is 0.049, lending further support to the notion that the primary balance is still responding positively to changes in the level of debt even in the latter periods of the analysis. The state-space graph (Figure 4) indicates that prior to the 1990s the fiscal policy reaction was negative as rising debt was not addressed in a sustainable fashion. Nevertheless, positive fiscal policy responses observed throughout the 1990s and into the 2000s suggest that the approach has shifted, becoming more positive, and implying the adoption of sustainable approach during the that period. Notably, however, the strength of the

reaction has begun to decline, indicating that the adjustment of the primary deficit toward the end of the period of analysis has begun to weaken.

Figure 4: State Space Representation (Confidence Intervals in Red)



Conclusion

This study examined the growth of Barbados' debt over the period 1975 to2010, with particular emphasis on guaranteed debt. The analysis suggests that total debt as increased significantly and, in the most recent periods, the inclusion of previously guaranteed debt which has been brought to book has contributed notably to this increase.To examine the fiscal policy response to this type of debt, a fiscal policy response function was constructed within a co-integration framework which took into account the possible endogeneity of the variables. The results were consistent with long-run sustainability, suggesting that Barbados'primary fiscal balancehas historically responded in a systematic way to changes in the level of debt. By focusing on total debt, inclusive of guaranteed debt, these findingssuggest that successive governments have generally accounted for fluctuations in both on-budget and off-budget debt.

While the approach used allows for the determination of the long-run response to changes in the level of privately-held debt, it is silent on the sources of the adjustment and whether the fiscal alterations are driven endogenously or exogenously (for example, through

IMF-sponsored policies). This is an important area for future research since the source of adjustment has both economic and social implications for whether there will be wide-spread, domestic support for measures necessary to bring the fiscal balance into equilibrium.

Moreover, while the results point to sustainable long-run fiscal policy, the state-space model suggests that the responsiveness of government's fiscal deficit to changes in the level of debt has begun to weaken, pointing to potential increases in debt service costs and burgeoning debt.This is compounded by an already high level of debt which has reduced fiscal space in recent years, suggesting that Government must work assiduously not only to meet the targets in its Medium-Term Fiscal Strategy, but to also focus closely on the issuance of loan and other guarantees.

Finally, the importance of reducing the level of debt becomes even more evident when considered in the context of local and international market sentiment. While the foregoing analysis suggests that increasing debt ratios in the short-run are reversed over time, if financial markets perceive that the level of the debt ratio is expanding beyond levels which are sustainable, Government could still face financing constraints in global capital markets. Thus, if market sentiment is paramount, in order for debt to be sustainable in a practical sense, the level of debt and the related interest payments have to be addressed directly if government is to avoid the need for draconian measures to reduce the level of debt in the future.

One possible way to address this issue may be for government to examine the structure of its existing debt and decrease the prominence of non-amortizing instruments in the portfolio. By gradually contracting the level of debt through principal payments, the long-term impact of interest payments may be minimized. This would in turn curtail the overall future deficits, enhance investor confidence and ensure long-term fiscal and debt sustainability.

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