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Debt Sustainability in Caribbean Countries: An Exploration of Alternative Methodologies

By

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CURRENCY EQUIVALENTS
(*as of December 31st 2005*)

US$ 1 = EC$ 2.70
US$ 1 = GA$ 220.14
US$ 1 = JA$ 65

i) The EC$ is pegged to US$ since 1979
ii) The exchange rate used to determine the dollar equivalent of Guyana and Jamaica is the end of the period rate

ABBREVIATIONS

ADF	–	Augmented Dickey-Fuller
BMCs	–	Borrowing Member Countries
BOP	–	Balance of Payment
CRC	–	Credible Repayment Commitment
CDB	–	Caribbean Development Bank
DOD	–	Disbursed outstanding debt
DOM	–	Dominica
DSA	–	Debt Sustainability Analysis
ECCB	–	Eastern Caribbean Central Bank
ECCU	–	Eastern Caribbean Currency Union
EXPD	–	Government Expenditure
GDP	–	Gross Domestic Product
GUY	–	Guyana
HIPC	–	Heavily Indebted Poor Countries
IDA	–	International Development Association
IDB	–	Inter-American Development Bank
IFS	–	International Financial Statistics
IFI	–	International Financing Institutions
IMF	–	International Monetary Fund
JAM	–	Jamaica
LDCs	–	Less Developed Countries
LHS	–	left hand side
MDG	–	Millennium Development Goals
MO	–	Mendoza and Oviedo
NPG	–	No Ponzi Game
NPV	–	Net Present Value
OECD	–	Organization for Economic Co-operation and Development
OPEC	–	Organization of the Petroleum Exporting Countries
PP	–	Phillips Perron
PVBC	–	Present Value Budget Constraint
RER	–	Real Exchange Rate Regime
REV	–	Government Revenue
RHS	–	Right hand Side
SKN	–	St. Kitts and Nevis
SSMC	–	St. Kitts Sugar Manufacturing Corporation
ToT	–	Terms of Trade

DEBT SUSTAINABILITY IN CARIBBEAN COUNTRIES: AN EXPLORATION OF ALTERNATIVE METHODOLOGIES

by

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ABSTRACT

This paper reviews alternative methodologies for measuring debt sustainability. It surveys recent literature with emphasis on developing countries. In this study, we apply the econometric approach and the gap analysis approach to fiscal data of St. Kitts and Nevis, Dominica, Jamaica and Guyana to analyze sustainability during the period 1970 – 2005. We find that the econometric approach is a useful approach that addresses issue of long-term sustainability. On the other hand, the gap analysis is more flexible and can be used to address short, medium and long-term sustainability. Also, it is more easily applied and provides concrete policy suggestions. The empirical results suggest that countries in the sample face serious issues of fiscal sustainability.

Keywords: Fiscal Sustainability, Debt, PVBC, Primary Gap, government expenditure, revenue, unit root, co-integration.

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1. INTRODUCTION

In many Caribbean economies, output growth in recent years has been relatively low and economic activity has not been vibrant enough to generate sufficient revenue to enable budget surpluses. Instead, these economies have been consistently registering relatively high budget deficits. Since today's deficit adds to tomorrow's expenditure to service new debt, deficits and debt reduction should be twin targets of any government. Debt burdens are problematic when future export and output growth would not be sufficient to enable countries to meet current and future domestic and external obligations without resorting to rescheduling. This is clear indication of unsustainable debt. Sustainability analysis seeks to address the issue as to whether government is headed towards excessive debt accumulation based on current policy.

In the Region, indebtedness in recent years has been on the rise. Therefore, a clear analytical framework for assessing debt sustainability is essential. Very few countries are unaffected by debt issues. Reviewing approaches to debt sustainability analysis (DSA) would help Caribbean economies understand the elements that underline DSA and help them assess the sustainability of their debt.

The main aim of this paper is to review the different approaches to determining fiscal and debt sustainability. In this regard a comprehensive review of the theoretical framework of alternative methodologies is presented in order to identify and develop the most appropriate approach to assessing sustainability in the Caribbean Development Bank's Borrowing Member Countries. The main analytical apparatus used in this study are the Econometric Approach and the Accounting Approach.

The remainder of this study is structured as follows. Section 2 discusses definitions of debt and fiscal sustainability. Section 3 is a comprehensive review of the theoretical framework of alternative methodologies focusing on the Accounting, Econometric, Sudden Stop, Probabilistic and the Human Development approaches of measuring fiscal and debt sustainability. Section 4 highlights the present and historical development of debt and budgetary deficits in Dominica, Guyana, Jamaica and St. Kitts and Nevis. Section 5 presents results of the econometric and accounting approaches. The policy recommendations and conclusion are discussed in Section 6.

2. CONCEPTS AND DEFINITION

Governments, and the public sector as a whole, not only have to service their external debt obligations, but all their debt obligations, including those contracted domestically. Public debt is the indebtedness of a central government, statutory bodies and contingent liabilities and comprises domestic and external debt. Domestic debt is owed to lenders within the country. The debt created is in the form of treasury bills, debentures, savings certificates or savings bonds. On the other hand, external debt is that part of the government debt which is owed to creditors outside the country. This debt includes money owed to private commercial banks, bond holders, other governments, or regional and international financial institutions such as the IDB, CDB, IMF and World Bank. Both domestic and foreign creditors play an important role in financing public development expenditures and the overall budget deficit.

Governments may borrow to meet temporary needs, when estimated revenue falls below or is exceeded by expenditures. Many governments incur debt because of an unwillingness to limit spending or increase taxes for fear of the political consequences. They may borrow to finance public programmes which do not generate revenue. Additionally, they may borrow to buffer unexpected expenses occurring as a result of natural disasters such as hurricanes, volcanic eruptions and earthquakes. When natural disasters arise, it is difficult to finance the extended activities of the government by new or increased taxes.

Public debt has an expansionary effect on employment and production during times of high unemployment. However, projects (both justifiable and unjustifiable) may be undertaken and government's demands may become so large that the interest rate on government bonds rises to the point where money is diverted from private enterprise. Too great a debt may induce currency depreciation or default on obligations. Rising interest rates will make borrowing more expensive and overtime these payments will absorb much of government's revenue and eventually debt would become unsustainable.

Debt sustainability is the ability of a debtor country to manage its debt continuously so that it does not expand beyond its control. The IMF and World Bank (2001) define "debt sustainability" as a country's ability to service its borrowing, external and domestic, public and publicly guaranteed, private non-guaranteed, including both short-term and long-term debt, without compromising its long-term development goals and objectives and without resorting to debt rescheduling or accumulation of arrears.

In the public sector context, a sustainable position is often viewed as one where the government (or public sector) is solvent. Solvency implies that the present value of government expenditure (including interest payments, and non-interest expenditure) should not exceed the present value of revenues. Alternatively stated, the present value of primary balances should at least be sufficient to cover the existing public debt. IMF (2002) suggests that solvency is only a necessary condition for sustainability because solvency could be accomplished with very large and costly future adjustments.

According to Blanchard (1990), sustainability is fundamentally about whether, based on the current policy, government is headed towards excessive debt accumulation. Blanchard (1990) further states than an economy is said to have achieved fiscal sustainability when the ratio of public sector debt to GDP is stationary, and consistent with the overall demand – both domestic and foreign, for government securities. This study likewise defines fiscal sustainability as governments' ability to repay current and future debt.

3. MEASURES OF DEBT SUSTAINABILITY

There are a variety of methodologies for defining and assessing the sustainability of fiscal programs. These include the ***Accounting approach, the Econometric approach, the Probabilistic model {Mendoza & Oviedo (2003)}, the Sudden Stop approach and the Human Development approach.*** These approaches use various indicators to show how fiscal policy expands and signals when it is likely that debt servicing would become increasingly difficult.

3.1 Accounting Approaches

3.1.1 Primary Balance Gap Indicator

The primary gap is a simple indicator of debt sustainability. It is based on computation of the primary balance needed to stabilize the debt-to-GDP ratio, and is the difference between the debt stabilizing primary balance and the actual primary balance. A positive gap is an indication that fiscal policy is causing debt accumulation, and, with unchanged policy, that debt can become unsustainable over time, given that the debt-to-GDP ratio cannot grow without limit.

The relationship between government's current debt, the last period's debt, the interest rate and the primary surplus can be expressed by the following budget constraint:

$$B_t = B_{t-1}(1+r_t) - S_t \qquad (1)$$

where S_t is the primary surplus and r_t is the real interest rate.

To derive the sustainability condition, equation (1) is reformulated in terms of ratios to GDP.

$$\frac{B_t}{Y_t} = \frac{1+r_t}{1+g_t}.\frac{B_{t-1}}{Y_{t-1}} - \frac{S_t}{Y_t} \qquad (2)$$

where g corresponds to the real growth rate of the economy, $Y_t = (1+g_t)Y_{t-1}$ *and* Y_t *denotes GDP*.

or $$b_t = \frac{1+r_t}{1+g_t} b_{t+1} - s_t \qquad (3)$$

Using equation (3) the change in b_t equals:

$$\Delta b_t = b_t - b_{t-1} = \frac{1+r_t}{1+g_t} b_{t-1} - b_{t-1} - s_t \qquad (4)$$

$$= \frac{r_t - g_t}{1+g_t} b_{t-1} - s_t \qquad (5)$$

When $r_t > g_t$ there is increasing pressure on the debt/GDP ratio. The reverse is true when $r_t < g_t$. In other words, when real interest rate is higher than real growth, the debt-to-GDP ratio will rise unless compensated for by the primary surplus.

The fiscal stance is considered sustainable if it generates a constant debt/GDP ratio. Therefore, fiscal sustainability implies that the $\Delta b_t = 0$. Thus, using equation (5) the primary balance needed to stabilize the public debt is:

$$s^* = \frac{r_t - g_t}{1+g_t} b_{t-1} \qquad (6)$$

The **primary gap indicator** is then:

$$s^* - s_t = -s_t + \frac{r_t - g}{1+g} b_{t-1} \qquad (7)$$

This is the difference between the required primary surplus s^* and the actual primary surplus s_t. A negative gap suggests that the required primary surplus is lower than the actual primary surplus, implying downward pressure on the debt-to-GDP ratio. If the indicator is positive, then the required primary surplus is higher than the actual primary surplus, suggesting that government must embark on fiscal adjustment programs to ensure that the debt-GDP ratio does not increase.

3.1.2 Tax Gap Indicator

Blanchard (1993) also defines sustainability as stability in the debt to GDP ratio and suggests a number of indicators (short, medium and long-term) that can be used to evaluate the sustainability of fiscal programmes implemented by government. Blanchard looked at the change in policies required to maintain the debt to GDP ratio constant. In this regard, he proposed the application of a "tax-gap" indicator. The tax gap indicates the increase in tax ratio (tax effort and/or the cut in expenditure) required for public debt sustainability.

The permanent tax to output ratio necessary to stabilize the debt ratio is given by:

$$\bar{t} = G_t - (g_t - r_t) b_t \qquad (8)$$

where G_t is the ratio of government non-interest spending to output , t_t is the tax to output ratio, r_t is the real interest rate, g_t is the real growth rate of GDP and b_t denotes the current debt stock.

Adding t_t to both sides of equation (8) yields the **tax gap indicator**:

$$t_t - \bar{t} = t_t + (g_t - r_t) b_t - G_t \qquad (9)$$

Equation (9) measures the difference between the permanent tax ratio and the current tax ratio. A positive indicator shows that current taxes are too low to stabilize the debt ratio, given current spending policies and that fiscal policy is thus unsustainable.

3.1.3 Net worth Gap Indicator

Buiter (1985) suggested a somewhat different indicator of sustainability and "defined a sustainable policy as one capable of keeping the ratio of public sector net worth to output at its current level."

Net worth (NW) = Assets (Real + Financial) – Liabilities (Financial)

where Assets (A) = Fixed Capital + Financial Assets (Shares etc.)
and Financial Liabilities (L) = General Government Debt (Gross Outstanding Debt).

However, this indicator is hard to apply since the government net worth is very difficult to measure. Nonetheless, he argues that a sustainable fiscal policy should keep the ratio of public sector net worth to output constant. He calculated the ***permanent adjustment required*** to achieve this objective as:

$$F = R(S - W) \qquad (10)$$

where, F is the ratio of the required adjustment (or long-term deficit) to GDP , W is the ratio of net worth to GDP, R the real long-term interest rate and S the present value of government spending.

3.1.4 Critique

The gap approach relies on accounting indicators, and usually sets a constant debt-to-GDP ratio as a benchmark for the sustainability of fiscal policies. The gap approach, however, does not identify the level of debt which might be considered sustainable. It merely seeks to stabilize the debt ratio. Additionally, the exclusive emphasis which this approach puts on the relationship between GDP growth and increases in debt does not capture the important role that lenders ultimately play in determining what debt strategies are sustainable. [†] Furthermore, the absence of any reference to the structure of the debt and particularly the existence of external debt and the possible impact of exchange rate movements are other weaknesses of many gap approaches.

The interpretation of gap indicators is quite straightforward and simple. However, Chalk and Hemming (2000) argue that despite the simplicity and ease of interpretation associated with this approach, these indicators do not distinguish between countries with varying degrees of indebtedness and fiscal imbalance, and are therefore more useful in the case of countries characterized by high debt and primary deficits. Chalk and Hemming (2000) also state that the gap methodology can be applied to the majority of countries but for countries which are well-endowed with non-renewable resources, the usual approach can often give a misleading impression about fiscal sustainability, since financial wealth differs from resource wealth.

3.2 The Econometric Approach

The econometric approach assumes that the sustainability of fiscal policy depends ultimately on what level of fiscal deficit can be financed. Empirical implementations of this approach involve econometric testing of a set of time series data to determine stationarity and the possible existence of co-integration between revenue and expenditure.

The government budget constraint for period *t* can be written as follows:

$$B_t = B_{t-1}(1 + i_t) - (R_t - G_t) \qquad (11)$$

where B_t denotes government debt, i_t the nominal interest rate, G_t represents government expenditure (excluding interest payments), R_t government revenues and $R_t - G_t$ is the primary surplus.

[†] See Cuddington (1996).

Solving forward to a terminal period s from an initial period 0, the budget constraint can be represented as follows:

$$B_s = (1+i)^s B_{t-1} - \sum_{t=1}^{s} (R_t - G_t)(1+i)^{s-t} \quad (12)$$

Dividing throughout by $(1+i)^s$, rearranging to solve for B_{t-1} and letting $s \to \infty$ yields the government inter-temporal budget constraint:

$$B_{t-1} = \lim_{s\to\infty} \frac{B_s}{(1+i)^s} + \sum_{t=1}^{\infty} \frac{R_t - G_t}{(1+i)^t} \quad (13)$$

Since in the limit, the first term on the RHS in equation (13) equals zero, then the government's fiscal stance is sustainable only if the stock of outstanding debt B_{t-1} equals the discounted value of future government surpluses, given the assumption that at the end of the period nothing will be owed to creditors nor will debtors owe anything to government. Hence for sustainability:

$$B_{t-1} = \sum_{t=1}^{\infty} \frac{R_r - G_t}{(1+i)^t} \quad (14)$$

The first condition is often called the "No Ponzi Game" (NPG) condition. It implies that government cannot indefinitely accumulate debt by borrowing new money to pay back old liabilities including interest payments. Once this condition holds, then the government budget constraint is fulfilled. The NPG condition constrains the public debt from growing faster than the interest rate.

From the inter-temporal budget constraint, various tests of fiscal sustainability can be derived using the concept of co-integration. Following Hakkio and Rush (1991), equation (13) can be re-expressed as follows:

$$(G_t + iB_{t-1}) - R_t = \sum_{s=0}^{\infty} \frac{\Delta R_{t+s} - \Delta G_{t+s}}{(1+i)^{t+s}} + \lim_{s\to\infty} \frac{\Delta B_{t+s}}{(1+i)^{t+s}} \quad (15)$$

Where the last term goes to zero and G_t and R_t are assumed to be non-stationary so that the ΔR_t and ΔG_t are stationary. The result is that the RHS is stationary. This implies that the LHS of the equation must also be stationary {i.e. $(G_t + iB_t) - R_t$ must be stationary}. $(G_t + iB_{t-1}) - R_t$ can be stationary only if $(G_t + iB_{t-1})$ and R_t are co-integrated with the co-integrating vector being (1, -1). The test of co-integration therefore is a test of fiscal sustainability.

Jha (2001) used the econometric approach to conduct sustainability tests for a sample of low and middle income countries for the period 1950 – 1999. The results showed that in all countries both government expenditure and government revenue were non-stationary and not co-integrated. Jha (2001) therefore concluded that the fiscal deficits for both middle and low income countries in his sample were not sustainable in the long-run.

3.2.1 Critique

The econometric approach involves econometric testing of a set of historical time series data on government spending and revenue, to determine the existence of co-integration. However, these require long time series, a requirement that may be unrealistic in many developing countries, since data is relatively poor and limited with respect to time span and accuracy. Also, this technique captures only long-term sustainability and does not capture problems of short and medium term sustainability. Cuddington (1996) suggests that rather than using time series techniques to describe constant fiscal regimes, one can specify fiscal rules into the foreseeable future based on country-specific information on fiscal targets.

The econometric approach does not rule out large primary deficits or high debt. Government is simply required to run adequate primary surpluses in the future. Moreover, the restrictive condition only constrains the debt from growing faster than the interest rate. Additionally, it assumes that in the long run the country will be able to maintain access to financing.

3.3 Sudden Stop (SS) Approach

Edwards (2004) defines a sudden stop to be a period in which a country's net capital inflows (the financial account balance) decline by at least 5% of GDP in one year. However, there are various definitions of sudden stop. Most are centered on a sharp increase in the current account deficits, accompanied by a sharp decrease in the financial account balance. A substantial current account deficit raises a question about the country's capability of continually financing such an imbalance. This can trigger a panic that induces a sudden stop.

Sudden Stops in capital flows force abrupt adjustments of the current account deficit. A fall in the financing of the current account deficit implies that the country must follow a forced adjustment in its absorption of tradable goods. Since the consumption of non-tradable goods is a complement to the consumption of tradable goods, a fall in the latter will imply a fall in the former, leading to a decrease in non-tradable prices. Since, in a small open economy tradable prices are taken as a given, it implies that the real exchange rate (RER) must adjust. This adjustment will generate valuation effects on the debt-to-GDP ratio, which, in turn, affect fiscal sustainability. (Calvo, Izquierdo, and Talvi, 2003).

Empirical analysis of this approach was conducted by Calvo et. al (2003). They considered the effects of a depreciation of the RER of 50 percent on debt valuation and fiscal sustainability for Argentina, Brazil, Chile, Columbia and Ecuador for the year 1998. They found that the RER depreciation had a substantially negative effect on Argentina's fiscal performance.

Mendoza and Smith (2002) define three key features of sudden stops. First, a sharp reversal in the current account, triggered by the sudden loss of access to world credit markets. Second, a severe recession with large declines in domestic output, consumption and investment. Third, large relative price swings, with a collapse in domestic asset prices and the price of nontradable goods relative to tradables, and a sharp increase in the relative price of intermediate goods.

The SS approach proposed by Calvo, Izquierdo and Talvi (2003) takes into consideration the effects of real exchange rate depreciation on fiscal sustainability. In this regard they propose an indicator which incorporates the currency composition of the debt and GDP. They consider the case of a small open economy experiencing a current account deficit before a sudden stop takes place. By definition:

$$CAD = A^* + S^* - Y^* \qquad (16)$$

where CAD is the current account deficit, *A** is absorption of tradable goods, *S** represents net non-factor payments to foreigners, and *Y** is the supply of tradable goods. If financing of the current account deficit is stopped, the full amount of that imbalance would have to be cut, and therefore the current account balance must be adjusted abruptly.

Further, they considered a typical sustainability calculation, where the size of the primary surplus necessary to keep a constant ratio of debt to GDP is computed, given a cost of funds, and a growth rate for the economy. The equation is given by:

$$b_{t+1} = b_t \frac{(1+r)}{(1+\theta)} - s_t \qquad (17)$$

where b_t is the debt to GDP ratio, t time period, r is the real interest rate on debt, θ is the GDP growth rate, and s_t is the primary surplus as a share of GDP. To obtain a constant debt to GDP ratio ($\bar{b}_t$), r and θ are assumed to be constant and the required primary surplus must satisfy the following:

$$s_t = \bar{b}_t \left[\frac{(1+r)}{(1+\theta)} - 1 \right] \qquad (18)$$

This defines the steady state of debt. It is a traditional debt sustainability calculation, but Calvo et. al point out that it hides the true composition of the debt-to-GDP ratio b_t; because of this, debt is decomposed in terms of tradables and non-tradables.

$$\bar{b}_t = \frac{p_t B_t + B_t^*}{p Y_t + Y_t^*} = \frac{B_t + e_t B_t^*}{Y_t + e_t Y_t^*} \qquad (19)$$

where (e_t) is the real exchange rate (defined as the price of tradables relative to nontradables), p_t is the inverse of the real exchange rate, B_t is debt payable in terms of nontradables, B_t^* * is debt payable in terms of tradables, Y_t is output of non-tradables, and Y_t^* is output of tradables.

Calvo et. al (2003) emphasize that debt composition, as well as output composition, matter a great deal for sustainability analysis, because mismatches between debt and output composition can lead to substantial differences in valuation of the debt/GDP ratio following real exchange rate depreciation. For example, if $b_t = e_t B_t^* / Y_t$, all valuation effects take place only on debt. This is the worst case scenario in which RER depreciation has a substantially negative impact on fiscal sustainability. On the other hand if $(B_t / e_t B_t^*)/(Y_t / e_t Y_t^*) = 1$ the composition of debt and output are perfectly matched. When this condition holds, RER depreciation has no effect on fiscal sustainability. A value of 1 would indicate a perfect match and a value of zero would indicate the highest degree of mismatch.

3.3.1 *Critique*

Sudden Stops are modeled as large, unexpected shocks. One cannot tell whether the predictions of particular models are robust to changes allowing agents to act on expectations of sudden stops. Additionally, precautionary savings theory suggests that this can be a flaw because, when faced with possible catastrophic events, agents build a buffer stock of savings to lower the long-run probability of these outcomes.

Also, using the debt-to-GDP ratio to determine sustainability, the theory is implicitly assuming that resources can easily be directed from the rest of the economy to the tradable goods sector to generate the required foreign exchange. Often the majority of public debt is denominated in foreign currency.

3.4. The Probabilistic model of Mendoza and Oviedo (MO) (2003)

The Probabilistic model is a new approach to assessing fiscal sustainability proposed by Enrique G. Mendoza and Pedro Marcelo Oviedo (2003). The guiding principle of the model is that of Credible Repayment Commitment (CRC). Mendoza and Oviedo (2003) define debt sustainability as one in which the government is able to repay its debt and maintain the credit relationship. This implies that the government cannot accumulate more debt than it can service.

The probability model determines a threshold debt level, and produces estimates for the number of periods it will take to hit the debt threshold. Mendoza and Oviedo (2003) develop a complete dynamic stochastic general equilibrium model where the behavior of utility-maximizing individuals and profit-maximizing firms determines government revenues endogenously, all of this in a context where tradable and non-tradable goods are produced.

These assumptions lead to a simple formulation of the CRC, where the threshold value for the debt-to-GDP ratio satisfies the following condition:

$$b_{t-1} \leq b^* = \frac{t^{\min} - e^{\min}}{r - g} \qquad (20)$$

*where b** represents the threshold value for the debt-to-GDP ratio, $t^{\min}$ is the lowest possible realization of the ratio of government revenues to GDP, r_t interest rate, g_t GDP growth and $e^{\min}$ is the minimum level of the government expenditure-to-GDP ratio that can be sustained if a country were to enter a fiscal crisis in which tax revenue reaches and stays at $t^{\min}$ and pushes b_{t-1} above *b**.[‡]

The approach also captures the stock of debt that government is "willing" to repay if lenders choose *r* so that *b** reflects a debt rationing level that enforces the government's participation constraint (i.e. constraint under which the government always finds it preferable to repay and maintain a relationship with creditors). This implies that the government cannot accumulate more debt than it can service if it were to enter a fiscal crisis. There will be a debt limit above which no additional borrowing can take place. The model incorporates volatility of fiscal variables in determining ability to repay. Mendoza and Oviedo assume that the volatility in government revenues can be traced back to fundamentals such as terms-of-trade (ToT) shocks, sudden stops, international interest rates or productivity.

The Mendoza and Oviedo's probabilistic model requires information regarding the volatility of government revenue, average levels of revenue and expenditure, the size of potential adjustment in expenditure that would be needed if government were to fall into a state of crisis, an estimate of the risk-free interest rate on government debt and a growth rate for the economy.

3.4.1 Critique

Unlike the standard approach which defines a policy target (i.e. expressed as the primary balance-to-GDP) needed to stabilize the economy, Mendoza and Oviedo's model defines the "maximum" debt level and not a "target" debt level (to be achieved through policy adjustment). The maximum debt level is not the equilibrium or optimal debt level. Therefore, the task of government is to strengthen fundaments so that the probability of hitting the upper limit of government debt remains low. However, the debt level limit does not imply that governments with the debt levels at or below the limit are default-free. The possibility of default can still occur in the case where the inability to pay arises due to large unexpected shocks to either government revenues or outlays.

Secondly, for any given average revenue-to-GDP ratio, governments that have a less volatile revenue base will have higher t^{min} and hence they will be able to sustain higher levels of debt. Additionally, actual value of expenditure adjustment that can be announced is not as critical as the value of t^{min} that can be credibly announced. Countries which can commit to large adjustments in expenditure can sustain higher debt-to-GDP ratios and may never be asked to act on these commitments.

The focus on government debt misses fragile debt positions in the private sector that can subsequently become liabilities of the public sector. Often there is a domino effect when there is bankruptcy in the private sector.

[‡] Note that b* is the sustainable debt ratio in the long run.

3.5. Human Development Approach

A recent paper by Jeffrey Sachs summarizes the inconsistency of the approaches discussed, noting that "it is perfectly possible, and indeed is currently the case, for a country or region to have a 'sustainable debt' (and significant debt servicing) according to IMF macroeconomic criteria, while millions of people within the country are dying of hunger or disease". One of the key principles of this approach is that human development is imperative and should take precedence over debt payments. As a consequence, developing countries should be able to set aside as much fiscal revenues as is needed to reach these goals and only then use the remainder to pay debt service. Debt sustainability here is linked to the achievement of the millennium development goals[§]

The underlying principle of Sachs' (2002) approach is based on the inadequacy of the IMF debt sustainability analysis to deliver debt sustainability in the presence of imperative human development needs. Therefore, rather than arbitrarily setting "sustainable" ratios of debt to revenue and other arbitrary sub-criteria, the human development approach takes as its core the amount of revenue which a government can realistically be expected to raise after deductions of necessary funds for basic human needs have been made.

The approach is based on four assumptions. Firstly, *it is not reasonable to levy tax on income below the international absolute poverty line* which is determined by the World Bank to be $1 per person per day at purchasing power parity at 1985 prices. Secondly, *taxation of greater than 25% on incomes* (i.e. adjusted GDP), will give rise to excessive distortions in the economy and thus hinder economic development. Thirdly, *measurements of what countries can afford in terms of debt-servicing* are considered after minimum levels of government spending have been set aside to meet targets for the most basic level of human development. Human development expenditure is limited here to basic health and primary education. Lastly, ***only a limited amount of any remaining revenue should be allocated towards debt service***, in order to leave resources for other essential government expenditure. Servicing demands above this level would be inconsistent with debtor governments' ability to meet their countries' development needs.

The proposed human development approach involves three steps. Step 1, ***Determining the Resource Envelope***. This includes all available resources to Government and is defined as fiscal revenue, including grants. Including grants may cause overestimation because grants tend to flow irregularly as disbursements are subject to delays and dependent upon adherence to certain conditionalities. Additionally, the amount of income or GDP below the international absolute poverty line is subtracted from the taxable income base. In other words, earnings below the poverty line are not subject to taxation. This can be expressed as a percentage of GDP.

The second step involves, ***costing the human development expenditure***; the approach is based on the assumption that resources available to Highly Indebted Poor Countries (HIPC) governments must first be used for essential expenditures that are necessary to eradicate poverty. These expenses include those for social sector development (health, education, etc.), and basic infrastructure. Estimating the social costs relies on the resource requirements necessary to attain MDGs.

[§] see Box 2 for the MDGs

The final step entails, ***determining the net revenue available for all other expenditures***. Net revenue available for all other expenditures, including recurrent expenditure, personal emoluments, external debt service, etc. is obtained by deducting the total human development expenditure (in Step 2) from total available revenue (in Step 1). In a situation where net revenue is below zero, it would mean that debt service is unsustainable, warranting total debt cancellation and increased grant aid. If the amount is above zero, then one would proceed to assess external debt against net revenue.

3.5.1 Critique

There are limits to the human needs approach. Firstly, it is not designed for all countries but specifically for those economies which are highly impoverished and so arguably will have limited applicability to CDB's BMCs with the exception Haiti. Secondly, it does not pay adequate regard to domestic debt nor private sector debt. Private sector liabilities can become government debt if guaranteed by government. Thirdly, the methodology allows countries to pursue their most basic human development needs in terms of health and education. However, essential needs for human development are not limited to these two areas.

Brief summary on the various approaches

In brief, the Accounting approaches (primary gap, tax gap and net worth gap indicators) are based on sustainability which concerns the behaviour of the borrower country and its willingness and ability to meet current and future debt obligations. Secondly, the Econometric approach is an approach which analyzes whether a government can manage its budget deficit in the long-run. The Sudden Stop approach looks at whether current policies can cause a sudden cessation of capital inflows. Lastly, the Probabilistic model is one which analyzes government's ability to credibly commit to repay its debt while maintaining its credit relationship with its lenders.

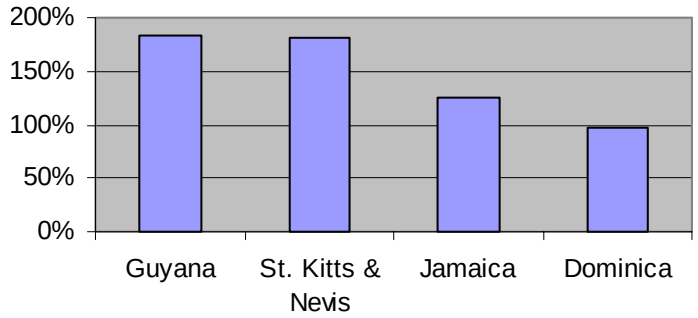
The above-mentioned theories build on the government budget constraint, which links together the fiscal deficit, public debt, economic growth, inflation, interest rate and the balance of payment. The methodologies do not indicate what level of debt is sustainable. Instead, they indicate whether given policies can lead to upwards trends in the debt-to-GDP ratio and ascertain when fiscal adjustment is required. Additionally, these approaches consider financial sustainability. However, DSA should also consider economic sustainability since a country should not only be able to generate enough resources to serve its debt obligation but also to improve its economic performance.

Unlike the above-mentioned approaches, the Human Development approach takes into account the amount of resources needed by debtor countries to reach specific targets of government expenditure and poverty reduction (as defined by the Millennium Development Goals). In some ways, it is more complex than the other approaches. It is particularly useful for very poor countries, because a high level of debt absorbs resources and causes monies to be diverted from growth and development.

4. ORIGIN OF DEBT BURDENS IN SELECTED MEMBER COUNTRIES

In the 1950s and 1960s, growth rates were typically high and interest rates were low. In contrast, during the 1970s and early 1980s, as a result of the oil supply shock and foreign exchange distress, growth rates fell, making it difficult for countries to service existing debt. As a result, economies resorted to new debt which worsened their debt status. Meanwhile, interest payments on loans mounted and so countries in the Caribbean were caught in the vicious cycle of large deficits, large debt service payments and substantial debt accumulation.

Figure 1:
Total Public Sector Debt to GDP Ratio 2005



Source: ECCB Debt Statistics Digest, Bank of Jamaica Annual Report & Bank of Guyana Annual Report

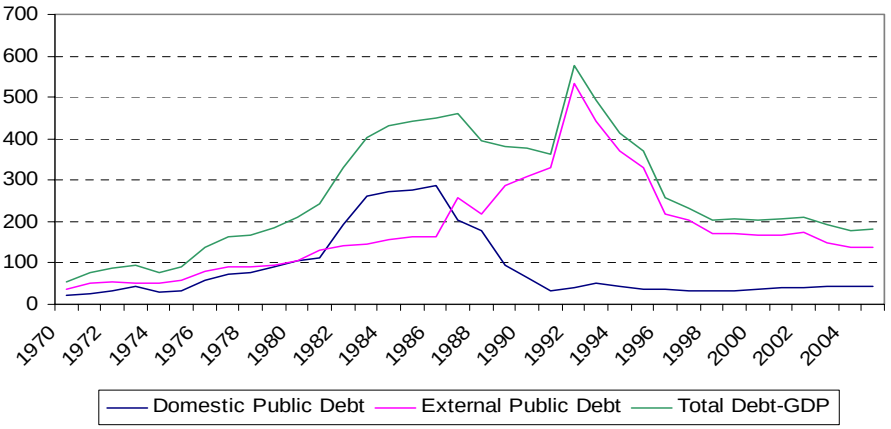
In 2003, 14 out of 15 Caribbean countries were among the top 30 of the world's most highly indebted countries {Sahay 2004}. During 2005, debt-to-GDP ratios remained relatively high in the Region. Among the highly indebted countries in the Region, are Guyana (183%), St. Kitts and Nevis (181%), Jamaica (125%) and Dominica (97%). Given the high levels of debt of these member countries, it is useful to examine the historical trends of debt. This will help in determining the factors which are accountable for the current and past levels of high indebtedness.

4.1 Guyana

One of the major consequences of Guyana's economic difficulties in the late 1970s was the incapacity to service its external indebtedness. This resulted in an accumulation and capitalisation of arrears. With limited access to international financing, and with low levels of export earnings and depleted foreign exchange reserves, the stock of external debt ballooned to about US$2.1 billion at the end of 1992 and total debt to GDP hiked to 575%. Guyana's stock of outstanding and disbursed total debt was estimated at US$1.4 billion at the end of December 2005. This is a decrease of approximately US$683 million in stock from US$2,118 million recorded at the end of December 1992. In 1992, domestic debt accounted for 7.1% of total outstanding public debt and external debt amounted to 92.9%. In comparison, domestic debt in 2005 represented 23.6% while external debt accounted for 76.4% of total outstanding debt.[**]

Figure 2. **Total Public Debt in Guyana (% GDP)**

[**] See figure 2



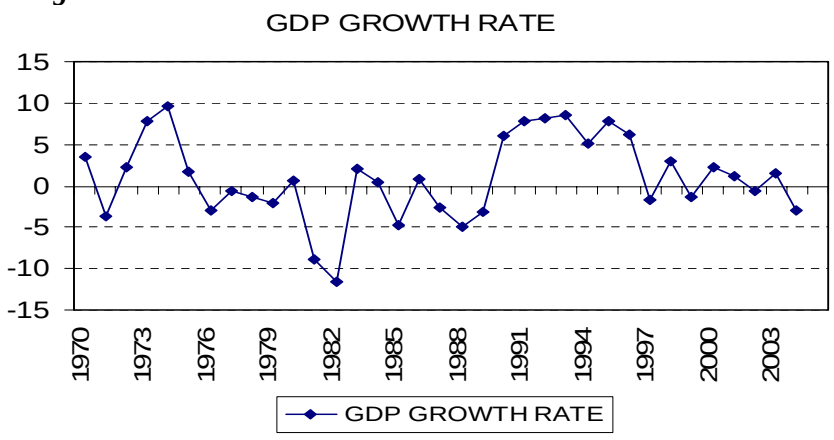
Source: International financial Statistics (2000& 2004Year Book

The total debt stock as a ratio of GDP declined substantially to 183% in 2005 from 575% at the end of the 1992. Guyana's total national debt over the period 1970 – 2005 averaged 260% of GDP.

Trends in Guyana's debt situation can be subdivided into three phases: (i) debt nationalization (1971 – 1977), (ii) debt rescheduling (1978 – 1982); and (iii) the debt arrears period (1983 – present). From 1971 through to 1977, the government undertook ownership and control of assets of companies such as the Demerara Bauxite Company (Co.), Reynolds Mining, Sprostons Engineering Co. and the Demerara Sugar Industry. Payment for these companies together with interest of between 6% and 8.5%, caused an increase of external debt by US$145.8 million.

By 1978, the government of Guyana resorted to debt rescheduling. Debt service payments were deferred and the payback period of the original loan was stretched over a longer period. During this period, debt increased by 408%. Borrowings were made to support the balance of payments and long-term development. By 1980, Guyana had significant inflows in the form of concessionary loans from bilateral and multilateral agencies. A significant amount was from the Trinidad and Tobago Oil Facility, while other sources were the IMF, World Bank, IDB and OPEC.

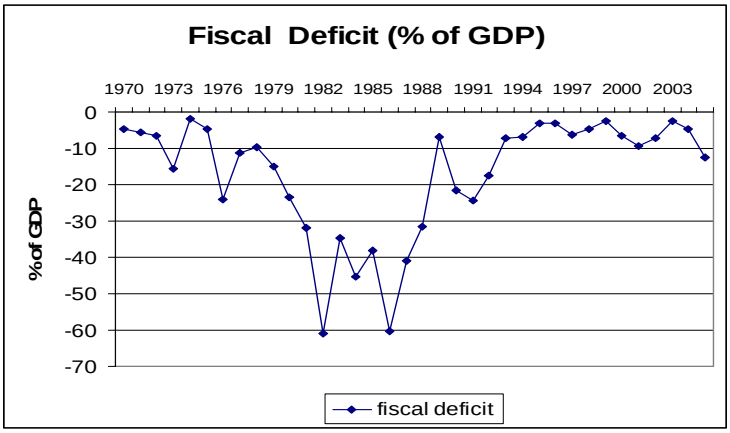
Figure 3



Source: Bank of Guyana, Annual reports (various issues)

Average GDP growth was estimated at -3.3% per annum between 1982 and 1990 (*see figure 3*), and per capita income declined from US$600 to US$350 in the same period. Additionally, real interest rates were generally negative, gross international reserves were depleted and Guyana increasingly relied on suppliers' credit to finance its external trade. As economic difficulties mounted and external and internal balances deteriorated, the country was unable to meet debt service obligations, leading to the cessation of support from the International Financial Institutions (IFI). This further deepened the economic crisis, depressing investments, employment and growth.

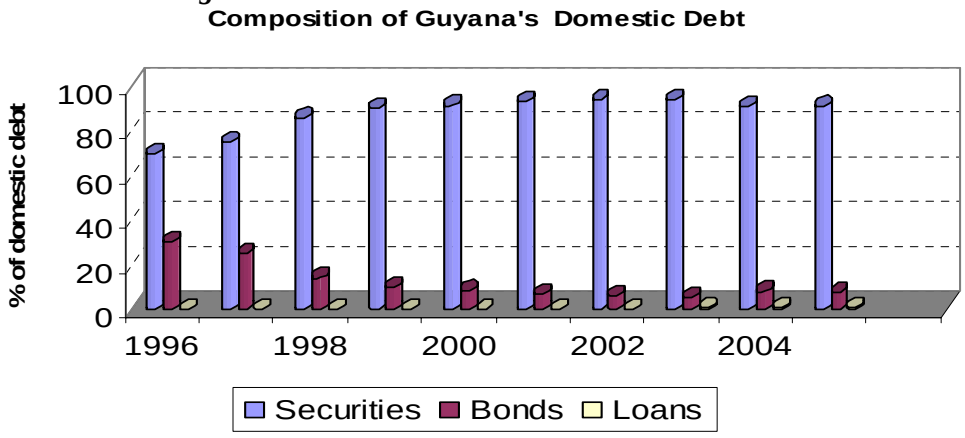
Figure 4



Source: Bank of Guyana Annual Reports (various issues)

In 1985 Guyana was ineligible to draw on IMF funds, since it defaulted on repayment. As a result, Guyana was unable to secure external assistance in the form of loans during the period 1985 - 1990. By the end of 1987, the deficit on the balance of payment had already amounted to US$85.4 million (60% of GDP) and Net International Reserves were at a level of US$-543.3 million. Fiscal policy had been severely constrained by the high internal and external debt burden. With total domestic and scheduled external debt services estimated at 61.2% of current revenues in 1996, very little revenue was available for expenditures on the social sector. From 1995 to 1997, the Government took aggressive steps to secure debt relief of US$600 million through direct negotiations with its official bilateral creditors. These negotiations were held under the auspices of the Paris Club, the United Kingdom, and Trinidad and Tobago.

Figure 5

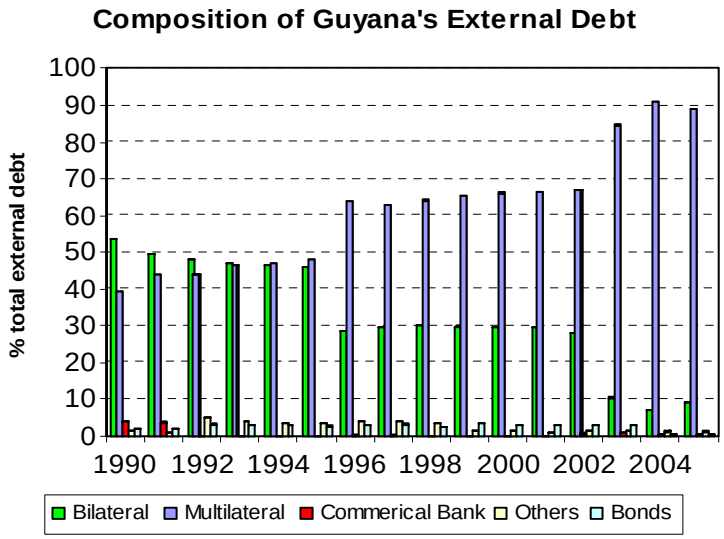


Source: Bank of Guyana Annual Report

Most of Guyana's domestic debt was contracted mainly through treasury bills and debentures i.e. securities. Treasury bills accounted for 73% of domestic debt in the 1990s and 80% during the years 2000 – 2005. On average loans represent 1% of total domestic debt.

Multilateral and bilateral loans and suppliers' credit constitute the government of Guyana's total external debt. In 2005, obligations to multilateral creditors amounted to 89.1% of outstanding debt, with indebtedness to the Caribbean Development Bank estimated at US$100.3 million and the IMF US$90.9 million. On average during the period 2000 – 2005 bilateral credit accounted for 9% of total external debt. (*See Figure 6*).

Figure 6



Source: Bank of Guyana Annual Report

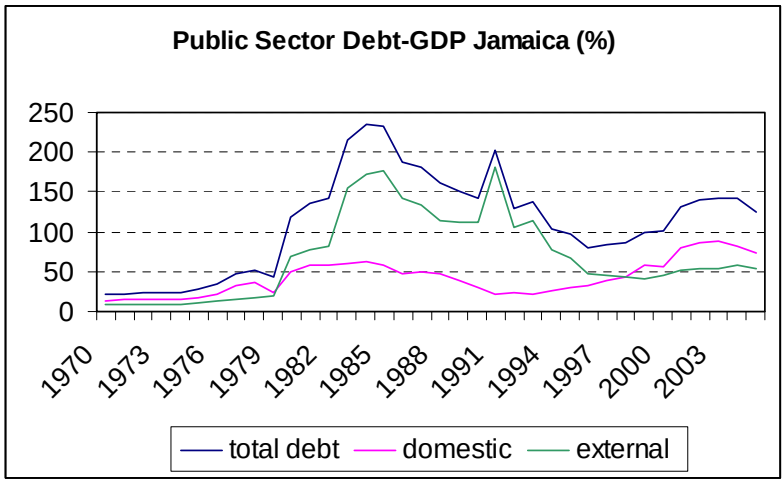
In 1999, through the Paris Club and the Heavily Indebted Poor Countries (HIPC) initiative, Guyana managed to negotiate US$256 million in debt forgiveness. Some improvements have been made but the debt burden is still substantial[††]. In 2005, total external debt outstanding was US$1.4 billion. In 2006, the IMF is expected to extend 100 percent debt relief to Guyana totaling US$322 Million under the Multilateral Debt Relief Initiative.

4.2 Jamaica

Jamaica's initial debt problems can also be traced back to the oil crises in the 1970s. During this period, the economy experienced two oil shocks which triggered a reduction in the demand for their export commodities, and deepened the need for borrowing to pay for increased oil bills as these rapidly led to a deterioration of Jamaica's current account balances.

[††] The Paris Club is an informal group of financial officials from 19 of the world's richest countries, which provides financial services such as debt restructuring, debt relief, and debt cancellation to indebted countries and their creditors. Debtors are often recommended by the International Monetary Fund after alternative solutions have failed.

Figure 7

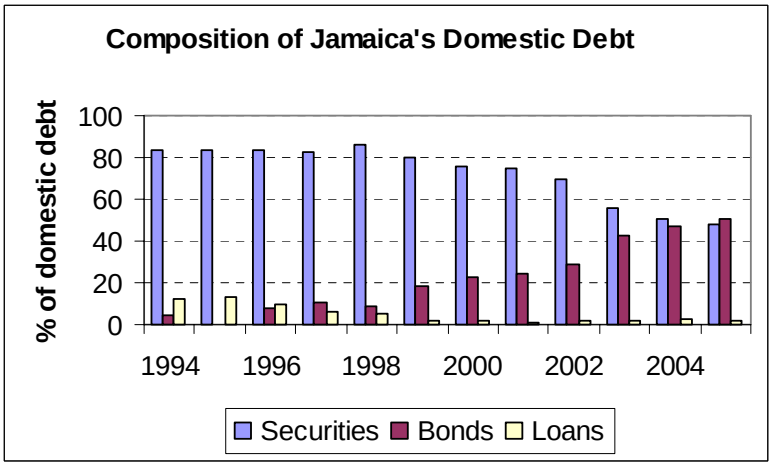


Source: The Bank of Jamaica Annual Reports (various issues)

In 1977, Jamaica's total outstanding external debt mounted to US$926.2 million (48% of GDP). During the 1970s, balance-of-payments shortfalls were financed increasingly through very large capital inflows in the form of concessional loans from multilateral and bilateral lending agencies. The IMF was the largest source of support. In July 1977, Jamaica sought help from the International Monetary Fund (IMF) and concluded an agreement under which the government undertook to replenish the country's foreign reserves, reduce the fiscal deficit, restrict domestic credit expansion and limit foreign borrowing. Unfortunately, Jamaica did not pass the December 1977 IMF performance test. Hence the agreement was abrogated.

A three-year Extended Fund Facility (EFF) agreement was signed in the late 1970s with the IMF that called for exchange rate unification and devaluation, increased taxes, curtailment of government expenditure and the tightening of domestic credit. The government did not adhere to all the IMF conditions, and negotiations were broken off in March 1980. To add to its economic hardship, in September 1988, Hurricane Gilbert hit Jamaica and disrupted production in most economic sectors. Throughout the 1980s, public debt increased rapidly. On average it amounted to 176% of GDP. However, Jamaica's total outstanding debt as a ratio of GDP decreased significantly to 125% in 2005 from 235% at the end of the 1984 (*see figure 7*). Disbursed outstanding debt was estimated at US$13.5 billion at the end of December 2005. This represented an increase of approximately US$6 billion in stock from US$7.6 billion recorded at the end of December 1984. Additionally, during 1984, domestic debt accounted for 26.5% of total outstanding public debt and external debt for 73.5%. In comparison, domestic debt in 2005 accounted for 57.8% while external debt accounted for 42.2%.

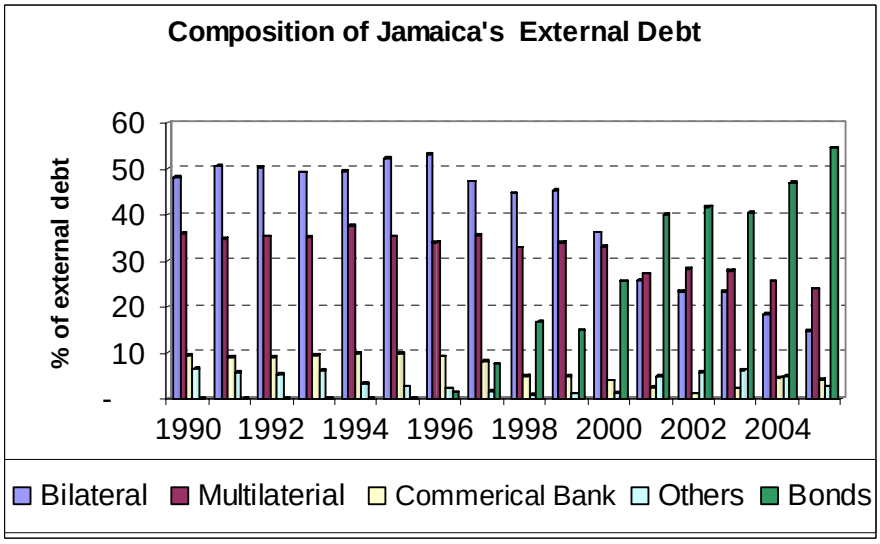
Figure 8



Source: The Bank of Jamaica Annual Reports (various issues)

On average for the period 1994 – 2005 domestic debt represented 73% of total outstanding debt. Similar to Guyana, most of Jamaica's domestic debt was contracted mainly in the form of treasury bills and debentures i.e. securities (see figure 8).

Figure 9



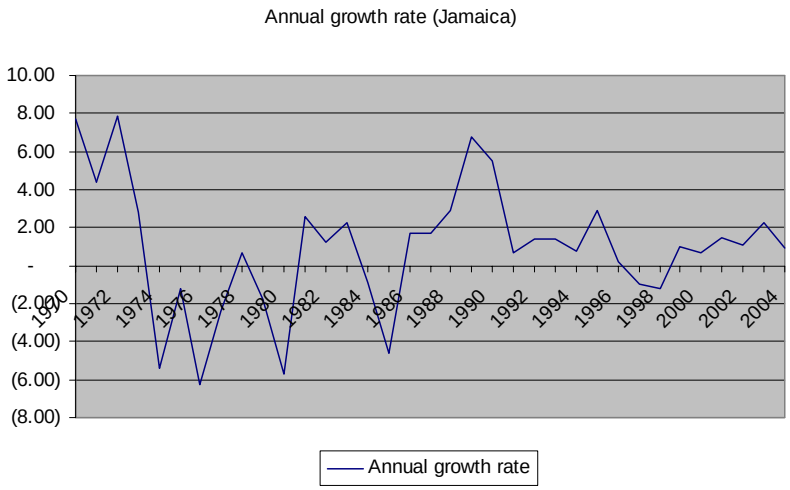
Source: The Bank of Jamaica Annual Reports (various issues)

In 2005, about 24% of the total external debt was owed to multilateral institutions, 15 % to bilateral creditors, 4 % to commercial banks, 54 % in bonds and 3% to other creditors (*figure* 9).

A sharp increase in interest payments, consistent with the move towards more commercial borrowing and a decline in the exchange rate of Jamaica's currency contributed to the deterioration in the debt situation between 1990 and 2005. In fact, interest payments rose to US$312.3 million in 2003.[⌗⌗] Exogenous factors such as the slowing of world trade, high levels of inflation, trade shocks and the decline in direct foreign investment also contributed to growth of Jamaica's external debt.

[⌗⌗] see Sahay (2005)

Figure 10

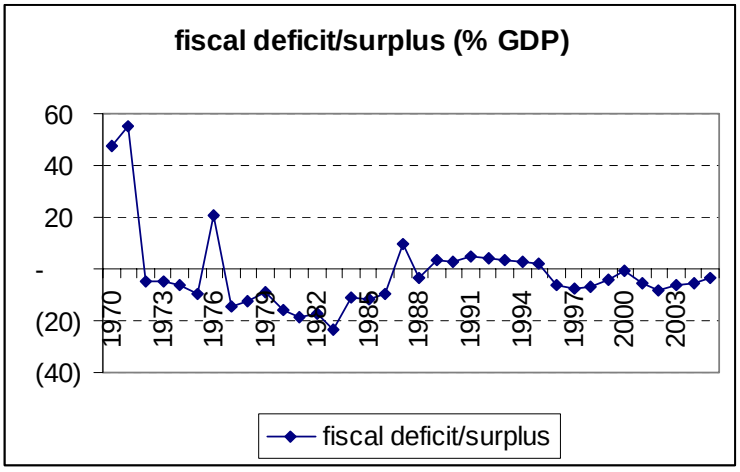


Source: Annual Statistical Digest, Jamaica (various issues)

High levels of debt were accompanied by declining economic growth. During 1971 - 1981 the economy experienced mainly negative real growth but registered positive growth from 1986 to 1997 (*figure 10*).

In general, Jamaica has run persistent fiscal deficits, with the average deficit between 1970 and 2005 being 6 % of GDP. In the 1970s, the fiscal deficit averaged 9% of GDP (*see figure 11*). During this period the economy was affected by increases in oil prices. By 1980, total debt stood at US$3.2 billion. During the period 1987 to 1995, deficits were lower as the government embarked on policies to foster improved growth through increases in foreign exchange earnings through tourism and the export of goods. As a result, deficits dropped to an average of 2 % of GDP.

Figure 11



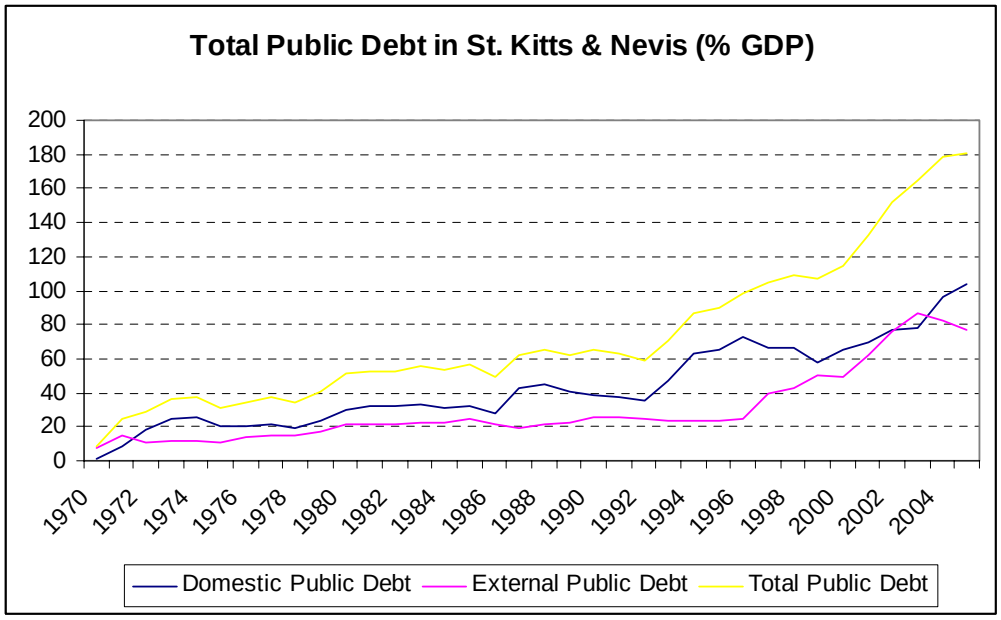
Source: Annual Statistical Digest & Bank of Jamaica Annual report (various issues)

Between 1990 and 2000 the fiscal balance improved. A substantial increase in export of goods and services, driven in part by the devaluation in the Jamaican currency, was one of the causes for improvements both in growth and fiscal performance. The exchange rate depreciated from JA$7.184 $\equiv US\$1$ in 1990 to JS$42 $\equiv US\$1$ in 2000.

4.3 St. Kitts and Nevis

In the 1970s the debt to GDP ratio averaged 35%. Total national debt grew from US$2.9 million (9%) in 1970 to US$16 million (41% GDP) in 1979 (*see figure 12*). Public debt began to increase moderately in the 1980s but by the 1990s, outstanding debt was exacerbated by large and persistent losses of the government's sugar company and devastating effects caused by three hurricanes - Hurricane Georges in 1998, Lenny in 1999 and Jose in 1999. By 2005, total debt outstanding was estimated at US$795 million or 181% of GDP (*see figure 12)*.

Figure 12

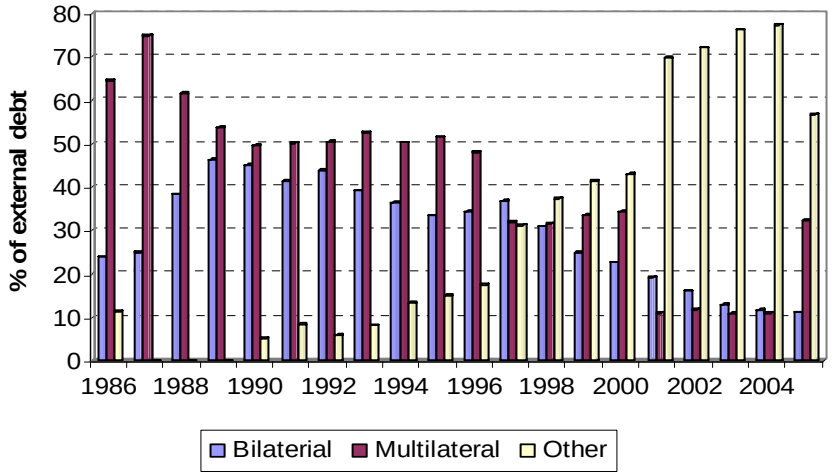


Source: Annual Statistical Digest, International Financial Statistics & the ECCB Annual Statistics

In September 1998, Hurricane Georges devastated St. Kitts and Nevis causing damages amounting to approximately US$167 million. In the agricultural sector, there was US$2.5 million worth of damages, and 50% of the following year's sugar harvest was destroyed. Other infrastructure damages included 80% of homes damaged and 20% completely destroyed while many schools, water and electrical facilities, commercial businesses, and public buildings were also damaged. As a result, by the end of 1998, disbursed outstanding debt was US$313 million (110% GDP), of which domestic debt represented 60% of GDP. Most of the domestic debt was in the form of treasury bills. On the other hand, the multilateral creditors which include CDB, the European Union, IDA, OPEC and the international bank accounted for close to 50% of GDP in total outstanding debt (*see figure 12*).

Figure 13

Composition of St. Kitts & Nevis External Debt

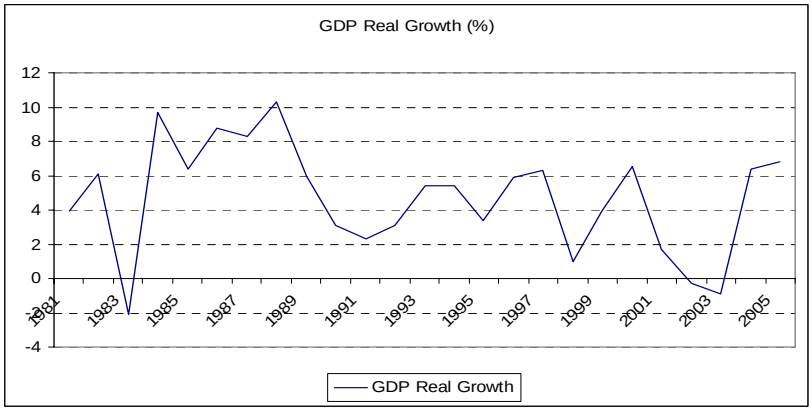


Source: ECCB

Lenny struck in 1999. It had a negative impact on the economy as it resulted in approximately US$2.7 million in damages. Later in 1999 hurricane José struck the island. It caused severe damages and weakened the country's infrastructure and its productive capacity. Borrowing to stabilize the St. Kitts and Nevis' economy after the passage of the above-mentioned hurricanes is one the central causes of St. Kitts and Nevis's high public debt.

On July 30th 2005 the sugar crop factory was closed. At that point total debt owed by St. Kitts Sugar Manufacturing Corporation (SSMC) to the St. Kitts-Nevis-Anguilla National Bank and the Development Bank was US$129 million. Borrowing by the Nevis Island Administration, the SSMC and the other public corporations placed upward pressure on the debt accumulation of St. Kitts and Nevis. In 2005, external debt declined by 6.2% while domestic debt increased by 17.2%, but the reconstruction of the economy after repeated natural disasters and increasing interest rates carried total public sector debt to US$795 million or 181% of GDP at the end of the year.

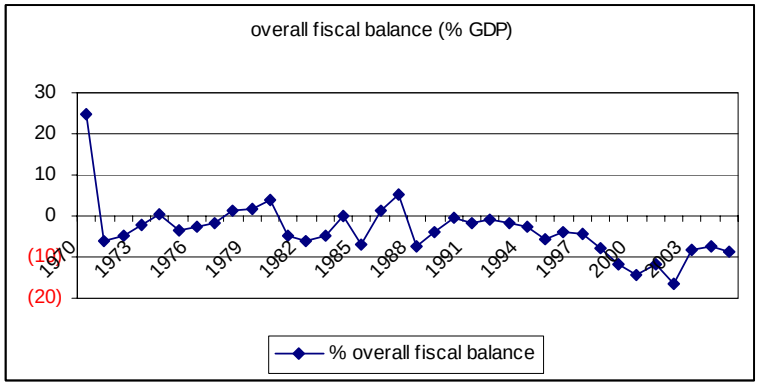
Figure 14



Source: Annual Statistical Digest & the ECCB Annual Statistics (various issues)

Real economic growth was estimated at 10.3% in 1988 compared with -0.9% in 2003. By 2005, real growth reached 6.4% (see figure 14). Economic growth was driven mainly by rapid expansion of tourism and related services as well as increased activities in the construction sector. The fiscal deficit in 1981 amounted to US$2.6 million; there was a persistent worsening in the fiscal balance up to the year 2005 (*see figure 15*).

Figure 15



Source: Annual Statistical Digest, International Financial Statistics & the ECCB Annual Statistics

In 2005, the government agreed to enter into an arrangement with the St. Kitts-Nevis-Anguilla National Bank whereby the debt would be serviced and retired over a 25-year period from proceeds of the sale of lands. Other strategies to reduce the public debt include continued and intensified fiscal consolidation, improved asset management including privatization and commercialization, liability management, and enhance economic growth.

4.4 Dominica

The Dominican economy depends on agriculture, primarily bananas and remains highly vulnerable to weather conditions, natural disasters and international economic developments. The combined impact of Hurricane David in 1979, the oil crisis which occurred in 1979, the political difficulties in the immediate post-Independence period, the impact of Hurricane Frederick and then Hurricane Allen in 1980, were devastating. This was reflected both in the scale of physical damage and in disruption caused in an economy which was already weak. As a result, real GDP declined by 17% in 1979, whilst income from the agricultural sector fell by 32% and non-agricultural output declined by 8.3%.

In 1994, the agricultural sector collapsed after crops were destroyed by a series of tropical storms. The island has nine active volcanoes with the most recent activity being an explosion in the Valley of Desolation in 1997. In 2004, the island experienced devastation from a series of earthquakes, which inflicted significant damage on its fragile infrastructure. During that year, earthquake damages in Dominica were estimated at US$33.3 million. These severe multiple shocks also brought intensified budgetary pressures from increasing expenditure on relief and capital costs of reconstruction.

The economy declined by 4.2 percent in 2001, 4.7 percent in 2002, and did not grow in 2003. The economic contraction was accompanied by rising public debt and debt service obligations. Also, during 2002, revenues were low and access to domestic and external financing were at high interest rates. The main reasons for fiscal deterioration were a combination of large unproductive investment projects and a shortfall in revenues since 2001. Due to the weakening of the fiscal position, the government borrowed more extensively. The additional borrowing came mainly from external creditors on commercial terms.

By 2003, Dominica's total debt stock was over 100% of the country's Gross Domestic Product (GDP), a level that is unsustainable given the economic circumstances of the country.[§§] A decision was taken by the IMF's Executive Board to approve a three-year US$11.4 million credit in late 2003. Additionally, The World Bank approved a US$3 million structural adjustment loan. In 2004, the country's external debt servicing was 11% of exports while interest payments accounted for 20% of its revenues.

As a result of the significant decrease in banana output, Dominica's foreign currency earnings contracted by 54% (to US$3.8 million) in 2003. Decreasing preferential access to the EU market for bananas and hurricane-related crop damages made it difficult for Dominica's banana industry. Banana exports fell by 38.5% to a record low of 10,563 tons in 2003.

In 2004, Dominica's government pursued debt restructuring. The IMF conducted a review of its economic performance to ensure compliance with the Letter of Intent. A comprehensive restructuring of the economy was carried out. This included the elimination of price controls, privatization of the state banana company, and tax increases, reduced civil service wages, improved public sector operations, increased revenues through a sales tax on travel tickets and an increase in custom service charges through an emergency budget so as to address Dominica's economic crisis and to meet IMF targets.

In 2005, Venezuela pledged to forgive Dominica's debt of US$1.5 million. Additionally, a grant of US$10.1 million was offered for airport improvements, including building a new terminal and parking lot and to light and lengthen the runway at Melville Hall airport.

4.5 Summary

Evidently, these Caribbean economies are faced with a serious debt problem. Some of these countries increasingly resort to new borrowing simply to service debt [IMF (2000)]. The international community was slow to recognize the external debt problems of these economies, most of which owed a significant percentage of their debt to official creditors and mostly on concessional terms. Multilateral and bilateral lenders have placed much emphasis on measures to deal with the problem of excessive indebtedness, through the Heavily Indebted Poor Countries (HIPC) Initiative as well as more recent proposals for additional relief for low-income countries and new Paris Club arrangements for middle-income countries. [***] Meanwhile, debt burdens of other Caribbean economies as well remain critical.

[§§] . The Eastern Caribbean Central Bank's benchmark is 60%

[***] In 1996, and as part of a new approach towards poverty reduction, the World Bank and the International Monetary Fund developed a Highly Indebted Poor Countries (HIPC) debt relief initiative.

5. Data Methodology and Results Analysis

This section applies the two main approaches used to assess fiscal and debt sustainability, namely the econometric approach and the Primary Gap Indicator. The study will examine fiscal data to analyze the short, medium-term (**Model 2)** and long-run (**Model 1)** fiscal and debt sustainability in selected countries. This section outlines the models and methodologies, describes the data and analyzes the results.

5.1 Model 1: Econometric Approach

5.1.1 Methodology

The paper utilizes time series data on public sector debt, government revenue and government expenditure inclusive of interest payments. The analysis involves the application of econometric techniques to determine the presence of unit roots and co-integration. The following regression equation is estimated:

$$R_t = \alpha + \beta(G_t + iB_{t-1}) + \varepsilon_t \qquad (21)$$

where $0 > \beta > 1$. The necessary and sufficient condition for sustainability is that the series in equation (21) must be co-integrated with vector $\beta(1-1)$. If only one of the series is I(1), while the other is I(0), the two series will diverge, and equation (21) will not hold, implying that public debt is not sustainable.

Therefore the estimation follows a two-stage procedure. In the first stage, using unit root tests, data are examined to determine if government expenditures and revenues follow a stationary process. The second stage involves testing for the existence of co-integration between government revenues and government expenditures.[†††]

Two separate tests for the order of integration are used in this paper - the augmented Dickey-Fuller (1981) test and the Phillips-Perron tests. The null hypothesis of these tests states that the respective series are characterized by a unit root and are therefore non-stationary, while the alternative states that the series are stationary.

The second stage involves assessing fiscal policy sustainability through the co-integration test. The study utilizes the procedure of Johansen (1988) and Johansen and Juselius (1990). Johansen et al. (1990) test the existence of the co-integration relationship among variables in a Vector autoregression (VAR) representation, and provide two likelihood ratio tests: (i) the *maximal eigen value test*; and (ii) the trace-test for the number of co-integrating vectors.

The null hypothesis is that there is no co-integration. If the null hypothesis is rejected, then the series is co-integrated. Several possible conclusions may be established: (i) there is no co-integration, that is, the fiscal deficit is not sustainable; (ii) there is co-integration with $\beta = 1$, that is, deficit is sustainable and (iii) there is co-integration, with $\beta < 1$, that is, government expenditures grow faster than government revenues, and the deficit may not be sustainable. [‡‡‡]

[†††] Hamilton and Flavin (1986) first used these procedures. See also Trehan and Walsh (1991) and Hakkio and Rush (1991).
[‡‡‡] See Hakko and Rush (1991) and Trehan and Walsh (1991)

5.1.2 Data Source

The countries in the sample are St. Kitts and Nevis, Dominica, Jamaica and Guyana. Their choice has been dictated by their current level of debt to GDP and by the availability of data. The data are annual from 1970 – 2005 and are obtained from the IMF *International Financial Statistics of the IMF, St. Kitts and Nevis' Annual Estimates, the Bank of Guyana Annual Report, Bank of Jamaica and ECCB Annual Economic and Financial Statistics, the ECCB Digest of External Debt* and *the CDB Economic and Social Indicators*. All variables are expressed as a percentage of GDP at current market prices. A graphical representation of the series is displayed in the Appendix. Definition and details of all data are detailed in the Appendix.

5.1.3 Empirical results

(i). Analysis for St. Kitts and Nevis:

The initial step of the analysis requires testing for unit root in the series. The Augmented Dickey-Fuller test (ADF test) and the Phillips-Perron test **(**PP test) were applied to the revenue (**REV)** and expenditure (**EXPD)** variables and the results are presented in table 1 below. The graphs in the appendix indicate that both variables have been growing over time; therefore, the test for the unit root hypothesis is conducted with the inclusion of a trend (with a constant). If the unit root hypothesis is rejected, the variables are trend stationary. The Akaike Information Criteria (AIC) was used to select the optimal lag length.

Table 1. Unit root test for fiscal variables – ratios to GDP 1970 – 2005: ***(SKN)***

Specification	specification	ADF t-stat	PP t-stat	Critical value	Conclusion
REV	Level	-1.74	-2.30	-3.64	Unit Root
	1st difference	-3.35	-7.72*	-3.64	Stationary
EXPD	Level	-1.94	-2.61	-3.64	Unit Root
	1st difference	-4.91*	-9.26*	-3.64	Stationary

*significant at the 1% level

The ADF and PP tests indicate that both revenue and expenditure are non-stationary in levels, but stationary in first differences. In other words, REV and EXPD are I(1) variables. Therefore the analysis proceeds to investigation of co-integration.

Table 2. Tests for cointegration between revenue and expenditure (% GDP): ***(SKN)***

Hypothesized No. of CEs	Eigenvalue	Trace Statistic	1 percent Critical Value
None	0.17	9.64	25.08
At most 1	0.09	3.09	12.76
Trace test indicates no cointegrating equation at the 1% significance level			
Hypothesized No. of CEs	**Eigenvalue**	**Max-Eigen Statistic**	**1 percent Critical Value**
None	0.18	6.54	20.16
At most 1	0.09	3.10	12.76
Max-eigenvalue test indicates no cointegrating equation(s) at the 1% level			

Notes. The estimations were obtained assuming a linear trend in the levels of the data, and only an intercept in the cointegration equations. The Johansen test results are based on a lag length of three (p=3) for the VAR in levels (p=3), i.e. using lags 1 2 in EViews 4.0. The lag length was chosen using the Akaike information criteria for the period 1970 – 2005.

The Johansen test for cointegration was applied, and the results are summarized in table 2. The results indicate that the null of no cointegration cannot be rejected. Hence, there is no cointegrating relationship among the variables. This indicates that St. Kitts and Nevis' fiscal policy has been unsustainable over the period 1970 – 2005.

(ii). Analysis for Dominica:

The graph of REV suggests it may be stationary. Results for the ADF and PP test confirm this as both tests indicate that REV is in fact stationary with t-stats of -5.39 and -5.44 respectively. However, the EXPD series contains a unit root. Given that REV is I(0) and EXPD is (1), the conclusion is that fiscal policy in Dominica has been unsustainable during the period 1970 – 2005.

Table 3. Unit root test for fiscal variables – ratios to GDP 1970 – 2005: (*Dominica)*

Specification	specification	ADF t-stat	PP t-stat	Critical value	Conclusion
REV	Level	-5.39*	-5.44*	-3.63	Stationary
EXPD	Level	-1.26	-2.83	-3.69	Unit Root
	1st difference	-3.78*	-10.39*	-3.72	Stationary

*significant at the 1% level

(iii) Analysis for Guyana: During the period 1981 – 1986, government expenditure (including interest payments) increased rapidly. On the other hand, government revenue fluctuated during that period. Based on the results from the ADF and PP tests in table 4, both revenue and expenditure are stationary at the 1% level only after first differencing, indicating that both variables are I(1). Since both variables are I(1), the analysis proceeds by testing for co-integration.

Table 4. Unit root test for fiscal variables – ratios to GDP 1970 – 2005: (*Guyana)*

Specification	specification	ADF t-stat	PP t-stat	Critical value	Conclusion
REV	Level	-2.61	-2.91	-3.65	Unit Root
	1st difference	-4.46*	-9.31*	-3.65	Stationary
EXP	Level	-1.97	-2.25	-3.65	Unit Root
	1st difference	-4.24*	-8.30*	-3.65	Stationary

*significant at the 1% level

According to Table 5 both the maximum eigenvalue and trace test indicate no co-integration at the 1% significant level. This implies that for Guyana fiscal policy was unsustainable over the sample period.

Table 5. Tests for cointegration between revenue and expenditure (% GDP): ***(Guyana)***

Hypothesized No. of CEs	Eigenvalue	Trace Statistic	1 percent Critical Value
None	0.53	38.02	25.08
At most 1	0.35	13.63	12.76
Trace test indicates no cointegrating equation at the 1% significance level			
Hypothesized No. of CEs	**Eigenvalue**	**Max-Eigen Statistic**	**1 percent Critical Value**
None	0.53	24.39	20.16
At most 1	0.34	13.63	12.76
Max-eigenvalue test indicates no cointegrating equation(s) at the 1% level			

(iv) Analysis for Jamaica:

Results in table 6 suggest the presence of a unit root in REV and EXPD. The null hypothesis cannot be rejected at the 1% level.

Table 6. Unit root test for fiscal variables – ratios to GDP 1970 – 2005: (Jamaica*)*

Specification	specification	ADF t-stat	PP t-stat	Critical value	Conclusion
REV	Level	-2.66	-2.49	-4.26	Unit Root
	1st difference	-4.79	-7.64	-4.27	Stationary
EXP	Level	-1.94	-2.40	-3.63	Unit Root
	1st difference	-7.50	-7.50	-3.63	Stationary

*significant at the 1% level

For the period 1970 – 2005 the Johansen test (see table 7) finds that there is no co-integration at the 1% level of significance. Hence the fiscal policy in Jamaica also has been unsustainable during the sample period.

Table 7. Tests for co-integration between revenue and expenditure (% GDP): ***(Jamaica)***

Hypothesized No. of CEs	Eigenvalue	Trace Statistic	1 percent Critical Value
None	0.41	22.38	25.08
At most 1	0.10	3.48	12.76
Trace test indicates no co-integration equation at the 1% significance level			
Hypothesized No. of CEs	**Eigenvalue**	**Max-Eigen Statistic**	**1 percent Critical Value**
None	0.44	18.90	20.16
At most 1	0.10	3.48	12.76
Max-eigenvalue test indicates no co-integration equation at the 1% level			

5.2 Model 2: The Primary Balance

The one-period primary gap is an indicator of short-run fiscal policy. The primary balance measures how the current fiscal policy stance affects the net indebtedness of the public sector. That is, since interest payments are the result of past deficits, excluding them from the fiscal balance provides a clearer picture of current behaviour. The primary balance is therefore a useful indicator of the sustainability of the fiscal stance.

Primary Gap Analysis (Buiter et al, 1993)

The government budget identity is defined as follows:

$$B_t^d + X_t B^*_t = (1+r)B_{t-1}^d + (1+r^*)X_t B_{t-1}^* - S_t \quad (22)$$

Where B_t^d : domestic currency denominated debt

B_t^* : foreign currency denominated debt

X_t : current period exchange rate

r_{r-1} : ex post interest rate on domestic currency denominated debt

r_{t-1}^* : ex post interest rate on foreign currency denominated debt

S_t : primary surplus of the central government

The domestic and foreign currency denominated debt in this equation can be expressed in domestic currency by the following equation:

$$B_t = B_t^d + X_t B_t^* \quad (23)$$

where B_t is the total debt measured in domestic currency. Equation (23) can be rewritten as:

$$B_t \equiv (1+r_t)B_{t-1}^d + (1+r_t^*)X_t B_{t-1}^* - S_t \quad (24)$$

Let Y_t denote real GDP, and P_t the GDP deflator. Equation (24) can be written as:

$$\frac{B_t}{P_t Y_t} \equiv (1+r_t)\left(\frac{B_{t-1}^d}{P_t Y_t}\right) + (1+r_t^*)\left(\frac{X_t B_{t-1}^*}{P_t Y_t}\right) - \left(\frac{S_t}{P_t Y_t}\right) \quad (25)$$

Denoting g_t as the real growth rate of GDP, π_t as the rate of inflation; γ_t as the rate of appreciation of the exchange rate $\{(X_t - X_{t-1})/X_{t-1}\}$ for period *t* and using $P_t \equiv P_{t-1}(1+\pi_t)$, $Y_t \equiv Y_{t-1}(1+g_t)$ and $X_t = X_{t-1}(1+\gamma_t)$ in equation (25) gives the following:

$$\frac{B_t}{P_t Y_t} \equiv \frac{(1+i_t)}{(1+\pi)(1+g_t)}\left(\frac{B^d_{t-1}}{P_{t-1}Y_{t-1}}\right)+\left(\frac{(1+i^*_t)(1+\gamma_t)}{(1+\pi_t)(1+g_t)}\right)\frac{(X_{t-1}\cdot B^*_{t-1})}{P_{t-1}Y_{t-1}}-\frac{S}{P_t Y_r} \qquad (26)$$

Applying lowercase letters, equation (26) becomes:

$$b_t = \frac{(1+i_t)}{(1+\pi)(1+g_t)}b^d_{t-1}+\frac{(1+i^*)(1+\gamma)}{(1+\pi_t)(1+g_t)}b^*_{t-1}-s_t \qquad (27)$$

b_t = total public sector debt as a percentage of GDP

b^d_t = domestic debt as a percentage of GDP

b^*_t = external debt as a percentage of GDP

s_t = primary central government surplus as a percentage GDP

Using the following definition of the real market rate r_t, that is, $1+r_t = \frac{(1+i_t)}{(1+\pi_t)}$ and also $b^d_{t-1} = b_{t-1} - b^*_{t-1}$ equation (27) becomes :

$$b_t = \frac{(1+r_t)}{(1+g_t)}b_{t-1}+\left(\frac{(1+i^*)(1+\gamma_t)-(1+i_t)}{(1+\pi_t)(1+g_t)}\right)b^*_{t-1}-s_t \qquad (28)$$

where the bracketed expression is an adjustment factor accounting for the overestimate of interest applied to the external debt stock as a result of the first expression on the RHS. There the domestic real interest rate is applied to the entire debt stock. Let us call the bracketed term A.

Simplifying equation (28) using Buiter's definition of the augmented primary surplus to GDP:

$$\tilde{s}_t = s_t - Ab^*_{t-1} \qquad (29)$$

where s_t is the ratio of the actual primary surplus to GDP and inserting equation (29) for the augmented primary surplus to GDP ratio into equation (28) gives:

$$b_t = \frac{1+r_t}{1+g_t}b_{t-1}-\tilde{s}_t \qquad (30)$$

Assuming the desire to maintain unchanged a given level of indebtedness, i.e. that $b_t = b_{t-1} = b_{t+2}$ etc, $= b_0$ equation (31) becomes:

$$b_0 = \frac{1+r_t}{1+g_t}b_0-\tilde{s} \qquad (31)$$

Solving for $\tilde{s}$ gives:

$$\tilde{s} = \left(\frac{r - g_t}{1 + g_t} \right) b_0 \qquad (32)$$

where b_0 is the constant debt to GDP ratio. Thus the augmented surplus ratio is that required to maintain a stable debt-to-GDP ratio. Hence the one period primary gap indicator, which is the difference between the required augmented surplus ratio to GDP and the actual augmented surplus ratio to GDP, is an indicator of fiscal sustainability. (Blanchard, 1990; Buiter, 1995)

Of course, the primary gap indicator can be estimated also for the medium (3 to 5 years) and the long-term (more than 10 years). In calculating the medium and long-term gaps, one can assume constant real interest and growth rates in the absence of more time specific forecasts. Only for Jamaica was the medium term gap estimated, given the availability of the forecasts for the relevant variables.

5.2.1 Results

Table 8 shows the estimated primary gap for the period 1991 to 2005. The estimates are also displayed graphically in the Appendix. The results show that the gap for Dominica was positive from 1991 to 2004. These are consistent with those of the co-integration analysis and suggest the need for further fiscal adjustment.

The results for St. Kitts and Nevis indicate that the primary gap is positive throughout the sample period except for three years. During those years 1993, 1997 and 2004, inflation and the real interest rate declined and real GDP growth increased. Like Dominica, the results are consistent with those of the co-integration analysis, suggesting that the fiscal stance is unsustainable and hence the need for adjustment.

With regards to Guyana, the gap was positive for nine out of the fifteen years examined. During the years in which the gap was negative 1993 – 1997 and 2002, GDP increased significantly, the interest rate on foreign debt declined and inflation also declined significantly. The results suggest that while Guyana's fiscal adjustment programme which got on the way in the early 1990s has been beneficial, Guyana's fiscal stance is still unsustainable.

From 1992 to 2003 Jamaica had positive one-period primary gaps. In 2004 and 2005 the gap was negative 4% and 8% respectively. In 2004 the real interest rate and domestic interest rate decreased while in 2005 the actual primary surplus increased by 27%.

The medium term forecast of the gap, however, suggests that, given the projected debt dynamics including for example, continued depreciation of the exchange rate, tightened interest rates and moderate or low growth rates, during 2006 – 2009, the gap would be positive. A gap of 2% is projected for 2006 to 2008. In 2009 the one period gap is expected to be 1%.

5.3 Summary of Results

The empirical findings suggest that Dominica, St. Kitts and Nevis, Jamaica and Guyana have not been on a sustainable fiscal path during the sample period. These findings are consistent with the overall conclusion of Sahay (2004) who noted that debt and budget deficits in several Caribbean countries were unsustainable and emphasized the need for fiscal adjustments.

6. Policy Recommendations

There are several possible strategies to successfully reducing public debt to more sustainable levels. These include fiscal consolidation, stable monetary policies, prudent debt management strategies, asset sales/privatization, reducing vulnerabilities to exogenous shocks, and growth-enhancing structural reforms. Given the exceptionally high levels of debt in some of these countries, a combination of all these elements is needed together perhaps with debt restructuring.

7. Conclusion

In this study, a comprehensive review was conducted on literature of fiscal sustainability with emphasis on developing countries. The research also examined historical trends of debt, real growth rates and fiscal balances in selected BMCs to determine the main factors responsible for the current and past levels of high indebtedness. In this regard we found that the oil supply shocks, natural disasters, high interest rates, low growth rates and bad governance are significant contributors.

The econometric approach is an approach which looks at long-run sustainability and is well grounded in theory. It tells us whether or not there is sustainability. However, it does not indicate what level of adjustment should take place; on the other hand, the gap analysis addresses this short coming. Additionally, it is simple and easy to apply. Therefore, given this and the fact that Caribbean economies are faced with a severe problem of data quality and availability, it is proposed that CDB adopt the primary gap indicator as the main indicator for assessing the fiscal stance of BMCs, but particularly the medium term indicator, given that limitations of the one-period gap analysis.

The results in this paper support the proposition that the continuation of the current fiscal stance of St. Kitts and Nevis, Dominica, Jamaica and Guyana is unsustainable, and needs to be altered to prevent an adverse response from lenders. This conclusion is based on a time series analysis of government revenue and expenditure data. Empirical analysis found evidence of non-stationarity and lack of co-integration of government revenue and expenditure. The gap analysis also supported the conclusion that the fiscal stance in the sample countries is unsustainable. Hence, the general conclusion of the analysis is that all four countries need to make fiscal adjustments to ascertain sustainability.

To the extent that there are off-balance sheet projects, that is, projects for which the cost is not included in the fiscal accounts, the valuations of public sector debt have been underestimated. Therefore, the fiscal adjustments required would be higher than those which have been estimated in this paper.

Table 8 Primary Gap Indicator of Fiscal Sustainability Selected Member Countries 1991 - 2005

Primary Gap Indicator of Fiscal Sustainability Selected Member Countries 1990 -2005																
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
								Guyana								
Actual primary surplus - GDP ratio	5%	2%	7%	10%	10%	7%	6%	3%	3%	4%	0%	-4%	3%	-3%	-2%	-10%
Augmented primary balance-GDP ratio	n/a	-391%	0%	29%	-14%	27%	18%	-18%	-19%	-10%	-1%	-1%	-2%	-12%	-11%	-15%
Required one-period primary surplus - GDP ratio	n/a	-207%	12%	5%	-31%	17%	-4%	-30%	21%	1%	12%	8%	-4%	-3%	-7%	-2%
One-period primary gap	n/a	**184%**	**12%**	**-24%**	**-18%**	**-10%**	**-21%**	**-12%**	**41%**	**11%**	**13%**	**9%**	**-2%**	**10%**	**4%**	**13%**
								St. Kitts and Nevis								
Actual primary surplus - GDP ratio	2%	-1%	1%	0%	0%	-4%	-1%	-1%	-3%	-2%	-10%	-9%	-7%	0%	0%	n/a
Augmented primary balance-GDP ratio	n/a	-1%	1%	1%	0%	-4%	-1%	-2%	-4%	-3%	-11%	-9%	-8%	0%	-1%	-2%
Required one-period primary surplus - GDP ratio	n/a	0%	1%	0%	0%	0%	-1%	-7%	2%	-1%	-2%	2%	8%	10%	-2%	-5%
One-period primary gap	n/a	**1%**	**0%**	**-1%**	**0%**	**4%**	**0%**	**-6%**	**6%**	**2%**	**8%**	**11%**	**15%**	**10%**	**-1%**	**n/a**
								Dominica								
Actual primary surplus - GDP ratio	n/a	-12%	-6%	-5%	-4%	-4%	-2%	0%	-1%	-2%	-8%	-3%	-7%	-5%	-2%	-3%
Augmented primary balance-GDP ratio	n/a	-6%	-5%	-2%	-2%	0%	1%	0%	0%	-7%	-2%	-7%	-3%	0%	-2%	n/a
Required one-period primary surplus - GDP ratio	n/a	0%	0%	3%	3%	3%	2%	2%	2%	3%	4%	9%	13%	7%	2%	n/a
One-period primary gap	n/a	**6%**	**5%**	**5%**	**5%**	**3%**	**1%**	**2%**	**2%**	**9%**	**6%**	**15%**	**16%**	**7%**	**4%**	n/a
								Jamaica								
Actual primary surplus - GDP ratio	n/a	n/a	13%	13%	13%	11%	5%	1%	5%	10%	12%	8%	7%	13%	12%	13%
Augmented primary balance-GDP ratio	n/a	n/a	-111%	17%	-6%	17%	14%	13%	12%	11%	12%	7%	6%	2%	8%	9%
Required one-period primary surplus - GDP ratio	n/a	n/a	9%	22%	24%	21%	25%	22%	22%	14%	15%	9%	13%	4%	5%	1%
One-period primary gap	n/a	n/a	**119%**	**5%**	**30%**	**3%**	**12%**	**9%**	**10%**	**3%**	**3%**	**2%**	**7%**	**2%**	**-4%**	**-8%**

Table 9	**Data and Calculations for One-Period Primary-Gap Indicator of Fiscal Sustainability for Jamaica 1991 - 2005 (US$'000')**										
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Outstanding External Debt	4,722,326	6,686,282	3,556,225	4,832,690	3,683,186	3,909,442	3,099,475	3,387,417	3,361,531	3,208,109	3,575,015
Ratio debt to GDP	111%	181%	106%	115%	77%	67%	47%	45%	43%	41%	45%
Domestic Debt	1,296,965	805,736	796,028	944,118	1,246,706	1,695,464	2,093,314	2,862,708	3,281,934	4,501,762	4,362,355
Ratio to GDP	31%	22%	24%	22%	26%	29%	32%	38%	42%	58%	55%
total debt	6,019,291	7,492,018	4,352,253	5,776,808	4,929,892	5,604,906	5,192,790	6,250,125	6,643,466	7,709,871	7,937,370
ratio to GDP	142%	202%	130%	137%	103%	97%	80%	84%	86%	100%	101%
Consolidated central government flow variables											
Tax Revenue	Total revenue & Grants	n.a.	1,026,024	1,347,313	1,347,887	1,666,846	1,699,504	1,876,291	2,027,146	2,316,807	2,351,796
Total expenditure	n.a.	n.a.	887,892	1,202,333	1,203,013	1,558,528	2,102,686	2,463,434	2,551,663	2,639,069	2,425,583
Interest Payments	n.a.	n.a.	299,342	388,208	453,817	511,388	734,925	693,809	946,350	1,070,175	998,474
Total Exp. (excluding Interest Payment)	n.a.	n.a.	588,550	814,125	749,196	1,047,140	1,367,761	1,769,625	1,605,313	1,568,894	1,427,109
Primary Surplus	n.a.	n.a.	**437,474**	**533,188**	**598,691**	**619,706**	**331,743**	**106,666**	**421,833**	**747,913**	**924,687**
Actual primary surplus - GDP ratio	n.a.	n.a.	13%	13%	13%	11%	5%	1%	5%	10%	12%
(1+i*)(1+e)-(1+i)	n.a.	n.a.	97%	-5%	20%	-11%	-15%	-25%	-16%	-4%	0%
(1+&)*(1+g)	n.a.	n.a.	142%	133%	128%	129%	116%	108%	107%	108%	107%
Correction factor for interest differentials	n.a.	n.a.	68%	-4%	16%	-8%	-13%	-23%	-15%	-4%	0%
	n.a.	n.a.	124%	-4%	18%	-7%	-9%	-11%	-7%	-2%	0%
Augmented primary balance-GDP ratio	n.a.	n.a.	-111%	17%	-6%	17%	14%	13%	12%	11%	12%
Exchange rate (Et - Et-1)/Et-1	25%	69%	90%	9%	33%	6%	6%	-5%	3%	7%	10%
Interest rates											
real interest rate	2%	-46%	6%	20%	19%	23%	26%	26%	25%	18%	16%
On Domestic debt	32%	34%	46%	50%	46%	49%	42%	35%	33%	25%	22%
On Foreign debt	7%	7%	7%	5%	5%	6%	6%	5%	6%	6%	5%
GDP at current market price	4,247,996	3,703,004	3,355,889	4,207,483	4,786,463	5,799,861	6,525,717	7,451,929	7,743,160	7,737,470	7,888,955
Real GDP growth	6%	1%	1%	2%	1%	3%	0%	-1%	-1%	1%	1%
inflation rate	30%	80%	40%	30%	27%	26%	16%	9%	8%	7%	6%
Required one-period primary surplus - GDP ratio	n.a.	n.a.	9%	22%	24%	21%	25%	22%	22%	14%	15%
One-period primary gap	n.a.	n.a.	119%	5%	30%	3%	12%	9%	10%	3%	3%

Table 9 Con't	**Data and Calculations for One-Period Primary-Gap Indicator of Fiscal Sustainability for Jamaica 1991 - 2005 (US$'000')**								
						Projection			
	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Outstanding External Debt	4,272,585	4,576,794	4,401,079	5,156,670	5,375,500	n.a.	n.a.	n.a.	n.a.
Ratio debt to GDP	53%	54%	54%	58%	53%	57%	55%	52%	49%
Domestic Debt	6,417,197	7,251,873	7,236,353	7,303,657	7,355,676	n.a.	n.a.	n.a.	n.a.
Ratio to GDP	79%	86%	88%	83%	72%	n.a.	n.a.	n.a.	n.a.
total debt	10,689,782	11,828,667	11,637,431	12,460,327	12,731,176	n.a.	n.a.	n.a.	n.a.
ratio to GDP	132%	140%	142%	141%	125%	113%	107%	100%	91%
Consolidated central government flow variables									
Total revenue & Grants	2,230,370	2,356,733	2,595,975	2,803,070	3,146,154	n.a.	n.a.	n.a.	n.a.
Tax Revenue	1,969,045	2,125,934	2,789,519	2,458,972	2,807,692	n.a.	n.a.	n.a.	n.a.
Total expenditure	2,691,625	3,078,096	3,095,412	3,259,763	3,146,154	n.a.	n.a.	n.a.	n.a.
Interest Payments	1,109,014	1,283,059	1,526,984	1,516,156	1,347,692	n.a.	n.a.	n.a.	n.a.
Total Exp. (excluding Interest Payment)	1,582,612	1,795,037	1,568,428	1,743,607	1,798,462	n.a.	n.a.	n.a.	n.a.
Primary Surplus	**647,759**	**561,697**	**1,027,547**	**1,059,464**	**1,347,692**	n.a.	n.a.	n.a.	n.a.
Actual primary surplus - GDP ratio	8%	7%	13%	12%	13%	13%	13%	13%	13%
(1+i*)(1+e)-(1+i)	3%	1%	23%	8%	9%	13%	12%	12%	11%
(1+&)*(1+g)	110%	108%	117%	115%	117%	111%	109%	109%	108%
Correction factor for interest differentials	3%	1%	20%	7%	7%	12%	11%	11%	10%
	1%	1%	11%	4%	4%	6%	6%	6%	5%
Augmented primary balance-GDP ratio	7%	6%	2%	8%	9%	7%	7%	7%	8%
Exchange rate (Et - Et-1)/Et-1	7%	5%	19%	6%	6%	10%	10%	10%	10%
Interest rates									
real interest rate	11%	11%	5%	4%	5%	7%	8%	8%	9%
On Domestic debt	20%	18%	19%	18%	18%	18%	18%	17%	17%
On Foreign debt	7%	7%	7%	6%	7%	9%	9%	9%	9%
GDP at current market price	8,115,586	8,471,022	8,190,130	8,825,367	10,157,000	11,967,497	3,447,155	15,089,431	16,829,268
Real GDP growth	2%	1%	2%	1%	4%				
inflation rate	9%	7%	14%	14%	13%	11%	9%	9%	8%
Required one-period primary surplus - GDP ratio	9%	13%	4%	5%	1%	9%	9%	9%	9%
One-period primary gap	2%	7%	2%	-4%	-8%	2%	2%	2%	1%

Table 10. Data and Calculations for One-Period Primary-Gap Indicator of Fiscal Sustainability for Dominica 1991 - 2005 (US$'000')									
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Outstanding External Debt	84,720	92,855	95,928	93,100	99,052	103,455	102,857	89,291	91,223
Ratio debt to GDP	49%	50%	50%	46%	46%	47%	44%	36%	36%
Domestic Debt	41,283	43,433	36,371	35,348	38,541	42,236	42,665	46,333	54,630
Ratio to GDP	24%	23%	19%	17%	18%	19%	18%	19%	21%
total debt	126,003	136,288	132,299	128,448	137,593	145,691	145,522	135,624	145,852
ratio to GDP	72%	73%	69%	63%	64%	66%	62%	55%	57%
Consolidated central government flow variables									
Total revenue & Grants	46,000.00	49,185.19	53,370.37	55,481.48	51,592.59	59,740.74	64,814.81	73,000.00	77,925.93
Tax Revenue	41,148.15	43,074.07	46,370.37	46,370.37	45,333.33	50,629.63	55,592.59	57,370.37	64,074.07
Total expenditure	68,851.85	62,962.96	67,592.59	68,148.15	65,222.22	69,666.67	71,222.22	80,481.48	89,333.33
Interest Payments	2,555.56	3,000.00	4,037.04	4,481.48	5,037.04	5,296.30	5,518.52	6,111.11	7,000.00
Total Exp. (excluding Interest Payment)	66,296.30	59,962.96	63,555.56	63,666.67	60,185.19	64,370.37	65,703.70	74,370.37	82,333.33
Primary Balance	**(20,296.30)**	**(10,777.78)**	**(10,185.19)**	**(8,185.19)**	**(8,592.59)**	**(4,629.63)**	**(888.89)**	**(1,370.37)**	**(4,407.41)**
Actual primary surplus - GDP ratio	-12%	-6%	-5%	-4%	-4%	-2%	0%	-1%	-2%
(1+i*)(1+e)-(1+i)	n.a.	0%	0%	-4%	-5%	-4%	-4%	-2%	-4%
		108%	108%	104%	102%	103%	105%	104%	104%
		0%	0%	-4%	-5%	-4%	-3%	-2%	-4%
Correction factor for interest differentials		0%	0%	-2%	-2%	-2%	-2%	-1%	-1%
Augmented primary suprlus - GDP ratio		-6%	-5%	-2%	-2%	0%	1%	0%	0%
Appreciat of Exchange rate (Et - Et-1)/Et-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Interest rates									
real interest rate	4%	2%	2%	6%	8%	6%	6%	5%	7%
On Domestic debt (check estimates for Dominica)	8%	8%	8%	8%	8%	8%	8%	8%	8%
On Foreign debt	2%	2%	2%	2%	2%	2%	2%	3%	3%
GDP at current market price	73,888.89	185,962.96	192,814.81	202,333.33	215,444.44	220,592.59	236,259.26	248,666.67	255,814.81
Real GDP growth	6%	2%	3%	2%	2%	2%	3%	2%	3%
inflation rate	3%	6%	6%	2%	0%	1%	2%	2%	1%
Required one-period primary surplus - GDP ratio		0%	0%	3%	3%	3%	2%	2%	2%
One-period primary gap		6%	5%	5%	5%	3%	1%	2%	2%

Table 10 con't	**Data and Calculations for One-Period Primary-Gap Indicator of Fiscal Sustainability for Dominica 1991 - 2005 (US$'000')**						
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Outstanding External Debt	132,119	149,989	174,833	201,521	218,918	207,429	208,351
Ratio debt to GDP	49%	55%	66%	79%	83%	73%	73%
Domestic Debt	74,852	76,222	91,556	93,889	6,704	62,593	69,521
Ratio to GDP	28%	28%	34%	37%	29%	22%	24%
total debt	206,971	226,211	266,389	295,410	295,621	270,022	277,872
ratio to GDP	77%	83%	100%	116%	112%	95%	97%
Consolidated central government flow variables							
Total revenue & Grants	76,555.56	79,851.85	76,148.15	72,111.11	76,185.19	87,851.85	n.a.
Tax Revenue	63,518.52	67,444.44	60,333.33	60,000.00	66,444.44	76,000.00	n.a.
Total expenditure	106,037.04	104,888.89	110,629.63	99,592.59	93,185.19	111,074.07	n.a.
Interest Payments	7,259.26	15,740.74	14,814.81	13,851.85	11,037.04	13,666.67	n.a.
Total Exp. (excluding Interest Payment)	98,777.78	89,148.15	95,814.81	85,740.74	82,148.15	97,407.41	n.a.
Primary Balance	**(22,222.22)**	**(9,296.30)**	**(19,666.67)**	**(13,629.63)**	**(5,962.96)**	**(9,555.56)**	n.a.
Actual primary surplus - GDP ratio	-8%	-3%	-7%	-5%	-2%	-3%	n.a.
(1+i*)(1+e)-(1+i)	-4%	-2%	-1%	-3%	-3%	-1%	-2%
	103%	102%	98%	95%	102%	106%	107%
Correction factor for interest differentials	-4%	-2%	-1%	-4%	-2%	-1%	-2%
	-1%	-1%	-1%	-2%	-2%	-1%	-1%
Augmented primary suprlus - GDP ratio	-7%	-2%	-7%	-3%	0%	-2%	n.a.
Appreciat of Exchange rate (Et - Et-1)/Et-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Interest rates							
real interest rate	6%	7%	6%	7%	6%	5%	4%
On Domestic debt (check estimates for Dominica)	8%	8%	8%	8%	8%	8%	8%
On Foreign debt	2%	4%	4%	4%	3%	4%	2%
GDP at current market price	267,703.70	271,185.19	266,111.11	254,851.85	262,814.81	285,555.55	285,555.55
Real GDP growth	2%	1%	-4%	-5%	0%	3%	3%
inflation rate	1%	1%	2%	0%	2%	3%	4%
Required one-period primary surplus - GDP ratio	3%	4%	9%	13%	7%	2%	1%
One-period primary gap	9%	6%	15%	16%	7%	4%	n.a.

Table 11. Data and Calculations for One-Period Primary-Gap Indicator of Fiscal Sustainability for St. Kitts 1991 - 2005 (US$'000')									
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Outstanding External Debt	39,880	41,778	44,074	46,741	51,645	55,071	61,388	107,634	123,866
Ratio debt to GDP	26%	25%	24%	24%	23%	24%	25%	39%	43%
Domestic Debt	59,005	61,635	63,487	92,889	139,630	151,222	179,139	181,912	189,704
Ratio to GDP	39%	37%	35%	47%	63%	66%	73%	66%	66%
total debt	98,885	103,413	107,561	139,630	191,275	206,293	240,527	289,546	313,570
ratio to GDP	65%	63%	59%	70%	86%	89%	98%	105%	109%
Consolidated central government flow variables									
Total revenue & Grants	39,333	35,037	40,037	45,778	49,704	67,037	75,148	82,111	88,000
Tax Revenue	26,519	25,481	28,148	32,630	36,111	47,667	52,778	60,333	65,000
Total expenditure	40,222	41,148	42,370	49,593	55,370	80,741	85,259	91,778	106,296
Interest Payments	4,593	5,037	4,111	4,741	4,889	4,963	7,370	7,741	9,148
Total Exp. (excluding Interest Payment)	35,630	36,111	38,259	44,852	50,481	75,778	77,889	84,037	97,148
Primary Surplus	3,704	(1,074)	1,778	926	(778)	(8,741)	(2,741)	(1,926)	(9,148)
Actual primary surplus - GDP ratio	2%	-1%	1%	0%	0%	-4%	-1%	-1%	-3%
(1+i*)(1+e)-(1+i)		2%	0%	-1%	-1%	1%	-1%	4%	2%
		107%	106%	107%	107%	107%	108%	115%	105%
		1%	0%	-1%	-1%	0%	-1%	4%	2%
Correction factor for interest differentials		0%	0%	0%	0%	0%	0%	1%	1%
Augmented primary suprlus - GDP ratio		-1%	1%	1%	0%	-4%	-1%	-2%	-4%
Exchange rate (Et - Et-1)/Et-1	0%	0%	0%	0%	0%	0%	0%	0%	0%
Interest rates									
real interest rate	3%	3%	4%	5%	5%	4%	4%	-2%	3%
On Domestic debt	7%	7%	7%	7%	7%	7%	7%	7%	7%
On Foreign debt	4%	4%	4%	4%	4%	4%	4%	3%	5%
GDP at current market price	152,519	164,556	181,815	198,333	221,741	230,630	245,741	274,926	287,111
Real GDP growth	3%	2%	3%	5%	5%	3%	6%	6%	1%
inflation rate	4%	5%	3%	2%	1%	3%	2%	8%	4%
Required one-period primary surplus - GDP ratio		0%	1%	0%	0%	0%	-1%	-7%	2%
One-period primary gap		1%	0%	-1%	0%	4%	0%	-6%	6%

Table 11. Con't Data and Calculations for One-Period Primary-Gap Indicator of Fiscal Sustainability for St. Kitts 1991 - 2005 (US$'000')							
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Outstanding External Debt	152,074	161,537	213,911	265,111	315,689	328,489	337,057
Ratio debt to GDP	50%	49%	62%	76%	86%	82%	77%
Domestic Debt	175,444	214,640	239,022	269,181	284,615	385,237	458,000
Ratio to GDP	58%	65%	70%	77%	78%	97%	104%
total debt	327,518	376,177	452,933	534,292	600,304	713,726	795,057
ratio to GDP	107%	114%	132%	152%	164%	179%	181%
Consolidated central government flow variables							
Total revenue & Grants	93,037	95,778	100,333	113,185	119,852	137,000	n.a.
Tax Revenue	68,000	69,630	72,074	78,556	86,630	104,407	n.a.
Total expenditure	110,519	145,778	149,148	162,741	146,519	163,963	n.a.
Interest Payments	11,741	15,778	19,407	24,778	27,593	28,185	n.a.
Total Exp. (excluding Interest Payment)	98,778	130,000	129,741	137,963	118,926	135,778	n.a.
Primary Surplus	(5,741)	(34,222)	(29,407)	(24,778)	926	1,222	n.a.
Actual primary surplus - GDP ratio	-2%	-10%	-9%	-7%	0%	0%	n.a.
(1+i*)(1+e)-(1+i)	2%	0%	0%	1%	1%	2%	2%
	107%	109%	104%	102%	101%	109%	111%
	2%	0%	0%	1%	1%	2%	2%
Correction factor for interest differentials	1%	0%	0%	0%	0%	1%	2%
Augmented primary suprlus - GDP ratio	-3%	-11%	-9%	-8%	0%	-1%	-2%
Exchange rate (Et - Et-1)/Et-1	0%	0%	0%	0%	0%	0%	0%
Interest rates							
real interest rate	3%	4%	5%	6%	5%	5%	4%
On Domestic debt	7%	7%	8%	8%	8%	8%	8%
On Foreign debt	5%	5%	6%	6%	6%	7%	6%
Gross Domestic Product							
GDP at current market price	305,000	329,222	342,407	350,963	365,111	398,667	439,296
Real GDP growth	4%	7%	2%	0%	-1%	6%	7%
inflation rate	3%	2%	2%	2%	2%	2%	4%
Required one-period primary surplus - GDP ratio	-1%	-2%	4%	8%	10%	-2%	-5%
One-period primary gap	2%	8%	13%	15%	10%	-1%	

Table 12. Data and Calculations for One-Period Primary-Gap Indicator of Fiscal Sustainability for Guyana 1991 - 2005 (US$'000')									
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Outstanding External Debt	1,226,730	1,112,190	1,967,200	1,953,500	1,999,500	2,058,300	1,537,025	1,513,020	1,210,924
Ratio debt to GDP	309%	330%	534%	442%	370%	331%	218%	202%	169%
Domestic Debt	264,347	113,326	150,358	224,423	230,727	234,172	268,363	238,840	238,218
Ratio to GDP	67%	34%	41%	51%	43%	38%	38%	32%	33%
total debt	1,491,077	1,225,516	2,117,558	2,177,923	2,230,227	2,292,472	1,805,388	1,751,860	1,449,142
ratio to GDP	3.76	3.64	5.75	4.92	4.12	3.69	2.56	2.34	2.02
Consolidated central government flow variables									
Total revenue & Grants	190,790	121,152	155,712	193,644	234,405	228,367	264,816	260,228	241,349
Tax Revenue	127,618	99,486	136,408	168,717	186,171	198,199	230,493	220,174	205,244
Total expenditure	276,825	203,136	219,664	225,225	267,411	248,692	287,003	312,221	287,580
Interest Payments	106,114	88,708	91,178	77,552	88,184	60,796	62,120	72,033	69,753
Total Exp. (excluding Interest Payment)	170,711	114,428	128,486	147,672	179,227	187,896	224,882	240,188	217,827
Primary Surplus	20,078	6,725	27,226	45,972	55,178	40,471	39,934	20,041	23,522
Actual primary surplus - GDP ratio	5%	2%	7%	10%	10%	7%	6%	3%	3%
(1+i*)(1+e)-(1+i)		247%	3%	-4%	7%	-6%	-4%	12%	11%
(1+&)*(1+g)		194%	123%	117%	126%	114%	113%	122%	99%
Correction factor for interest differentials		127%	2%	-3%	5%	-5%	-4%	10%	11%
		393%	7%	-19%	24%	-20%	-12%	21%	23%
Augmented primary balance-GDP ratio		-391%	0%	29%	-14%	27%	18%	-18%	-19%
Interest rates									
real interest rate	-46%	-52%	12%	9%	2%	9%	7%	-6%	7%
On Domestic debt	30%	31%	26%	17%	18%	18%	11%	9%	8%
On Foreign debt	6%	4%	2%	1%	2%	2%	2%	4%	4%
Exchange Rate (G$) %	45%	183%	12%	4%	6%	1%	1%	2%	14%
GDP at current market price	396,582	336,708.00	368,281	442,273	540,875	621,627	705,406	749,145	717,531
Real GDP growth	-3%	6%	8%	8%	9%	5%	8%	6%	-2%
GDP inflation rate	76%	83%	14%	8%	16%	8%	5%	15%	1%
Required one-period primary surplus - GDP ratio		-207%	12%	5%	-31%	17%	-4%	-30%	21%
One-period primary gap %		184%	12%	-24%	-18%	-10%	-21%	-12%	41%

Table 12. Con't Data and Calculations for One-Period Primary-Gap Indicator of Fiscal Sustainability for Guyana 1991 - 2005 (US$'000')							
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Outstanding External Debt	1,193,183	1,193,183	1,197,301	1,246,660	1,092,003	1,078,748	1,095,800
Ratio debt to GDP	172%	167%	168%	173%	147%	137%	140%
Domestic Debt	233,874	263,350	277,674	282,087	323,168	332,072	338,535
Ratio to GDP	34%	37%	39%	39%	44%	42%	43%
total debt	1,427,057	1,456,533	1,474,975	1,528,747	1,415,171	1,410,820	1,434,335
ratio to GDP	2.05	2.04	2.07	2.12	1.91	1.79	1.83
Consolidated central government flow variables							
Total revenue & Grants	234,576	263,902	251,696	264,452	277,452	311,639	346,832
Tax Revenue	186,665	207,684	200,310				
Total expenditure	248,229	316,771	319,982	278,888	330,253	349,748	443,994
Interest Payments	41,561	55,332	43,014	37,887	30,536	22,572	21,685
Total Exp. (excluding Interest Payment)	206,668	261,440	276,968	241,001	299,716	327,176	422,309
Primary Surplus	27,908	2,463	(25,272)	23,451	(22,264)	(15,537)	(75,477)
Actual primary surplus - GDP ratio	4%	0%	-4%	3%	-3%	-2%	-10%
(1+i*)(1+e)-(1+i)	10%	1%	-2%	3%	6%	6%	4%
(1+&)*(1+g)	111%	104%	104%	107%	104%	107%	105%
Correction factor for interest differentials	9%	1%	-2%	3%	5%	6%	4%
	14%	2%	-3%	5%	9%	9%	6%
Augmented primary balance-GDP ratio	-10%	-1%	-1%	-2%	-12%	-11%	-15%
Interest rates							
real interest rate	3%	4%	6%	-1%	-2%	-2%	-4%
On Domestic debt	11%	10%	8%	5%	3%	4%	4%
On Foreign debt	2%	3%	2%	1%	2%	2%	0%
Exchange Rate (G$) %	10%	2%	3%	1%	2%	2%	0%
Gross Domestic Product							
GDP at current market price	694,755	712,668	712,163	722,461	741,972	788,492	785,060
Real GDP growth	3%	-1%	2%	1%	-1%	2%	-3%
GDP inflation rate	8%	6%	2%	6%	5%	6%	8%
Required one-period primary surplus - GDP ratio	1%	12%	8%	-4%	-3%	-7%	-2%
One-period primary gap %	11%	13%	9%	-2%	10%	4%	13%

APPENDIX I

DATA DESCRIPTION

All data have been derived from various official sources and are annual in frequency.

Government revenue (**REV)** is defined as the sum of revenue receipts including recurrent and non-recurrent revenue including external grants in local currency converted to US$. Data were taken from St. Kitts and Nevis's Economic Report 1985 and the ECCB Annual Digest of Statistics from 1973 – 2005. Guyana's were complied from various issues of the Bank of Guyana Annual Report and Statistical Bulletin; Jamaica's from the Bank of Jamaica Annual Report and Statistical Bulletin. Dominica's data were extracted from various issues of the annual estimates from 1970 – 1983 and from the ECCB Annual Statistics thereafter. Government Expenditure (**EXPD**) is the aggregated disbursements of recurrent and non-recurrent expenditure including capital outlays, loans and interest payments.

The overall fiscal position is the fiscal deficit/surplus of central government and is calculated as the excess of EXPD over REV. It is financed both by external borrowing and domestic borrowing. Both external and domestic borrowings are components of the total public debt **(DEBT)**. Here real debt and debt normalized by GDP are considered. Data on domestic debt are not available for all years for Dominica. Publications on external Public Debt are readily available for Jamaica and Guyana. However, publications on domestic and external public debt for counties of the ECCU are unavailable before the 1980's therefore debt data prior to the 1980 were compiled using yearly publications of Domnica's and St. Kitts and Nevis' annual estimates.

GDP represents gross domestic product at the current market price in local currency. The data for each country were taken from the IFS yearbook and various issues of the Statistical Bulletin. The interest rate considered herein for each country is the effective interest rate (**r).** That is interest payments divided by the debt stock.

To ensure efficient use of the statistical tests carried out in the analysis, all data are expressed as a percentage of GDP and each currency has been converted to US$. Guyana GA$ and Jamaica JA$ are converted using the year averages of market exchanges rates.

Figure 16

The Econometric Approach

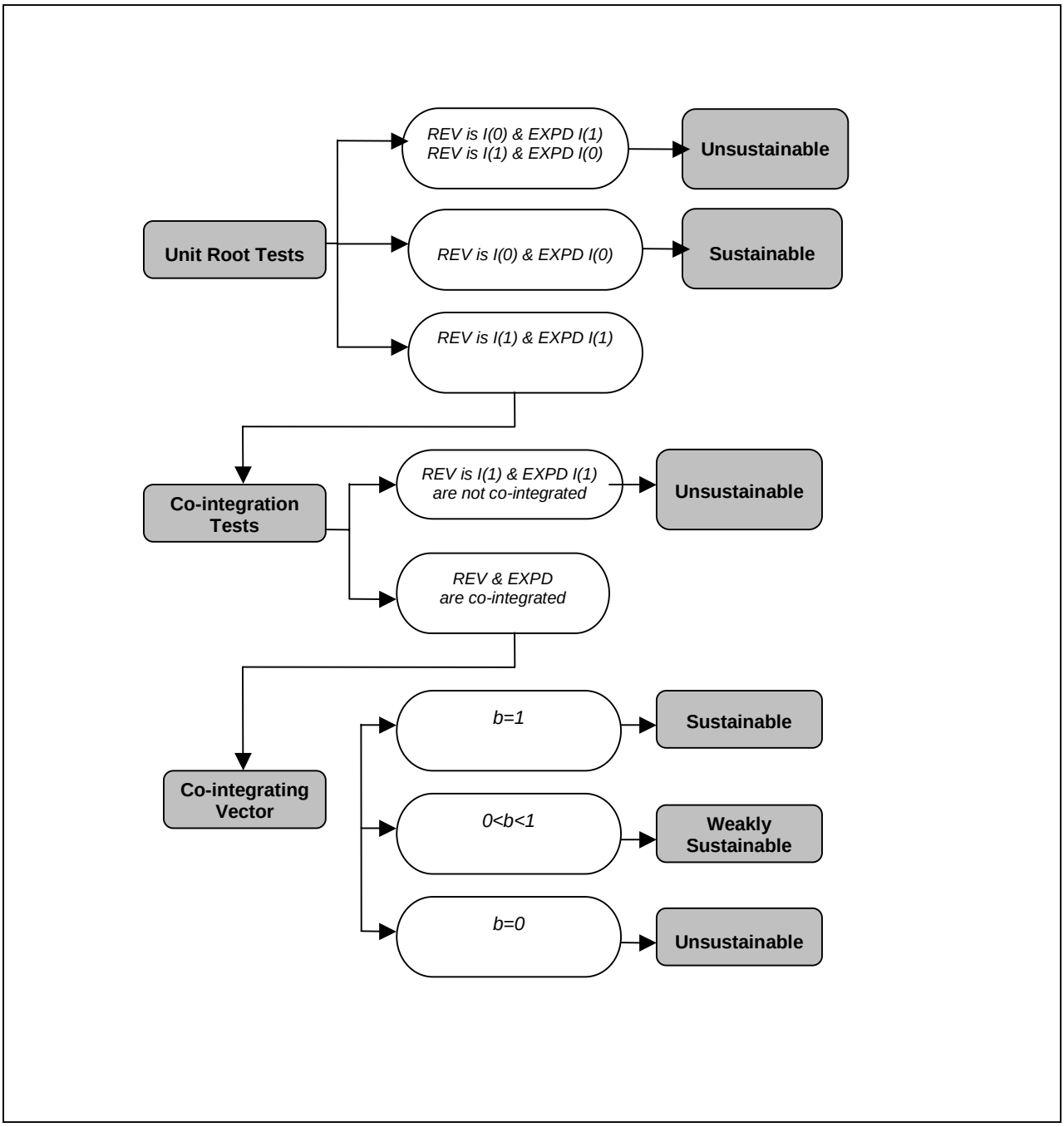


Figure 17.

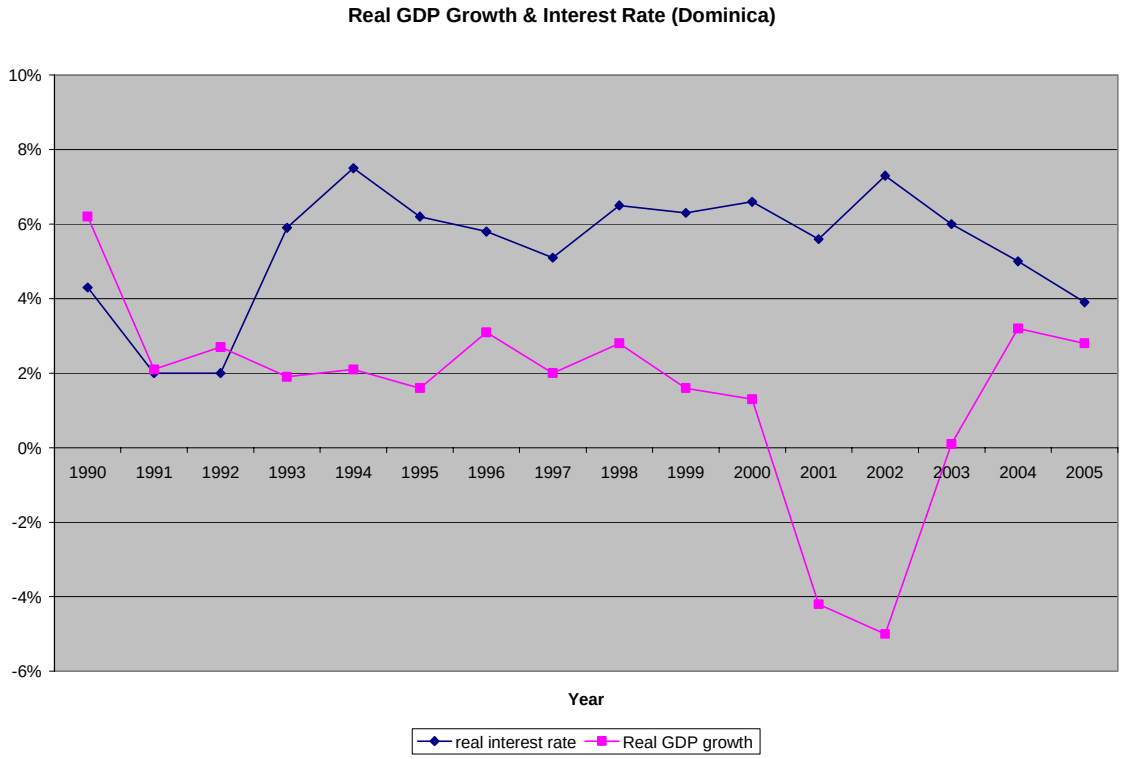


Figure 18.

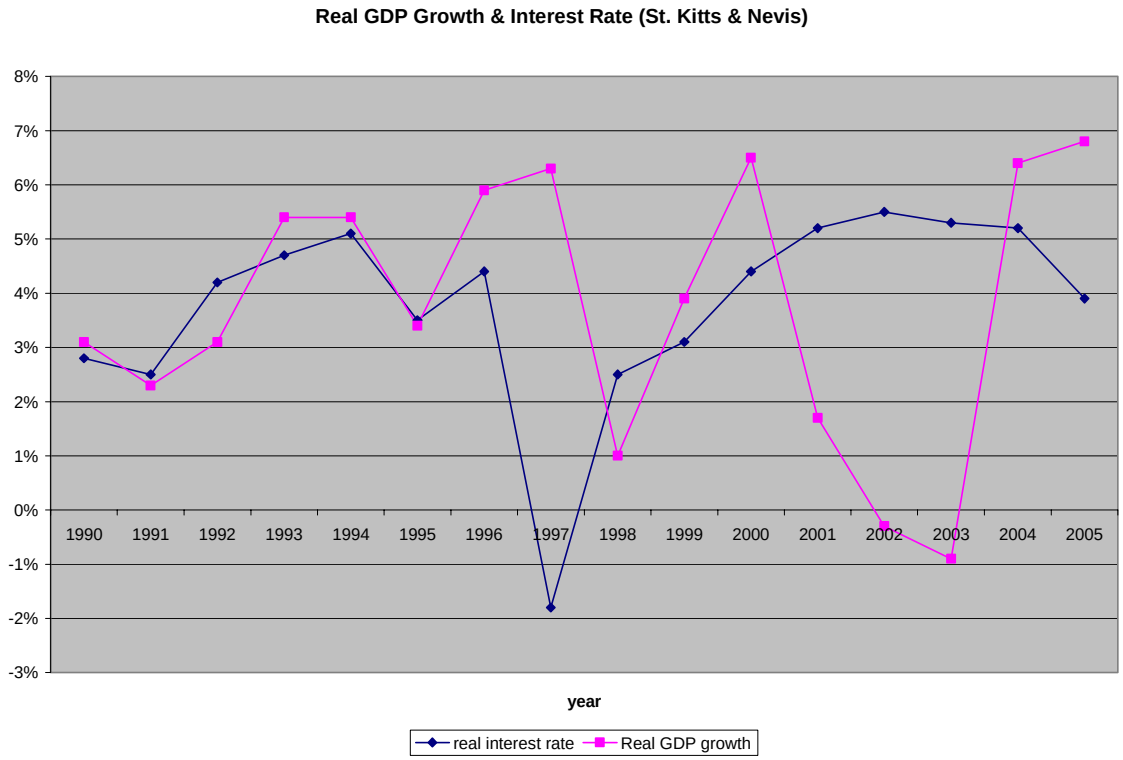


Figure 19.

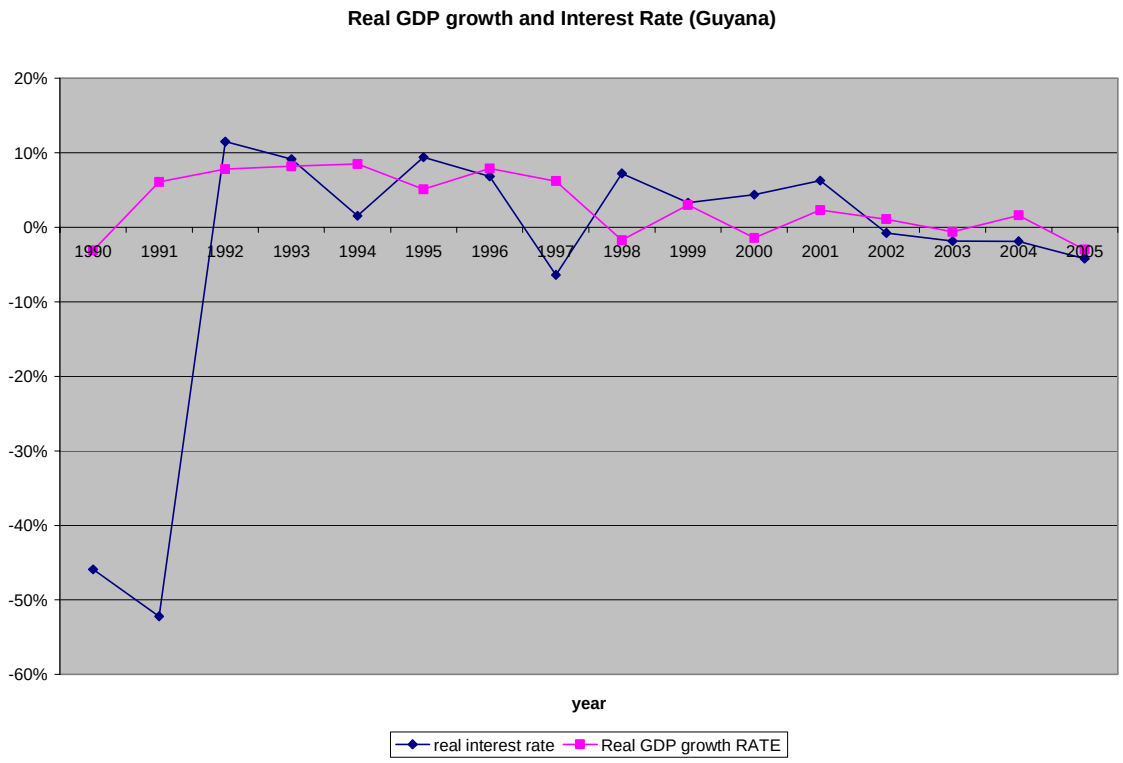


Figure 20.

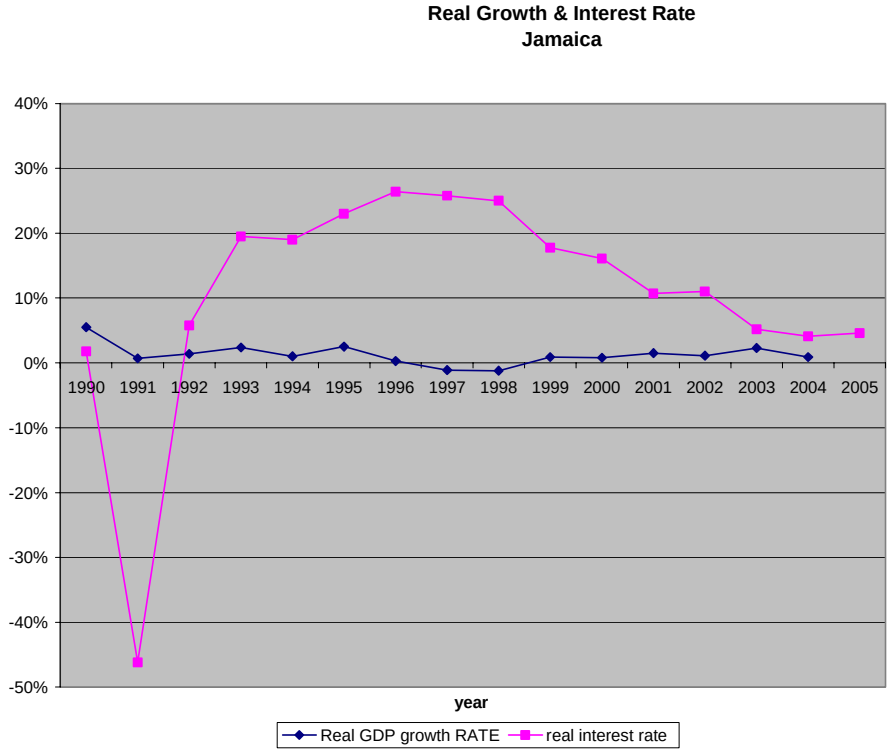


Figure 21.

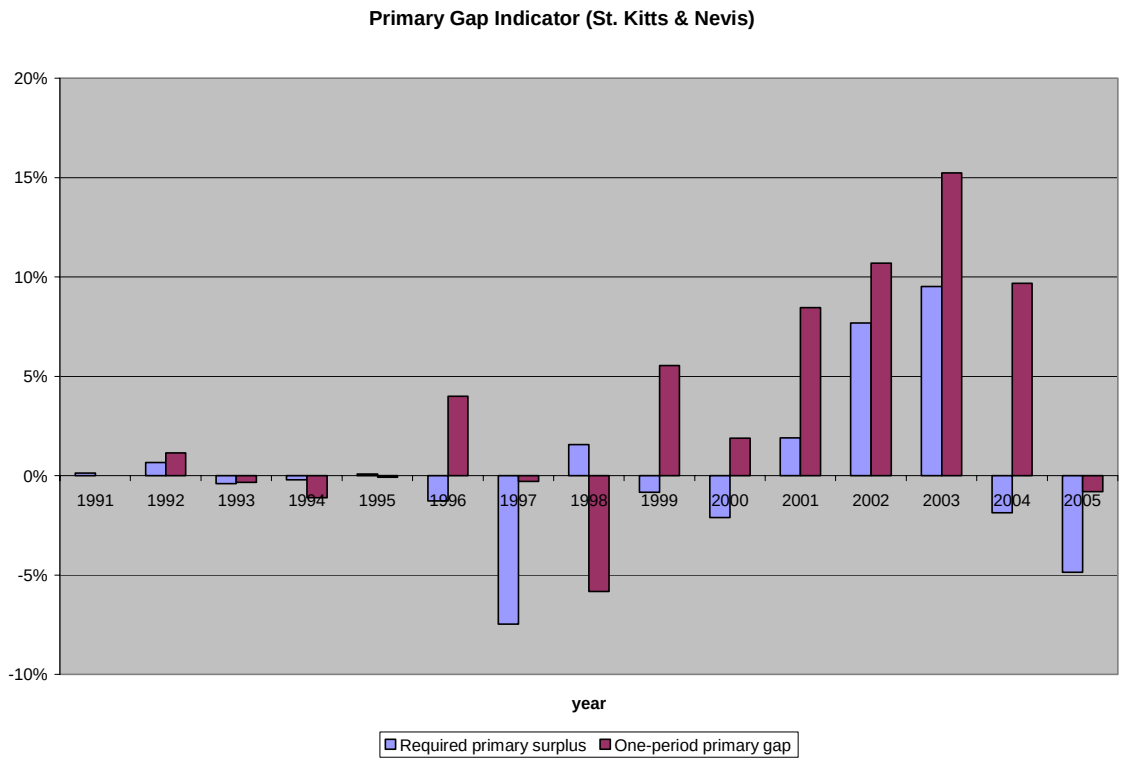


Figure 22.

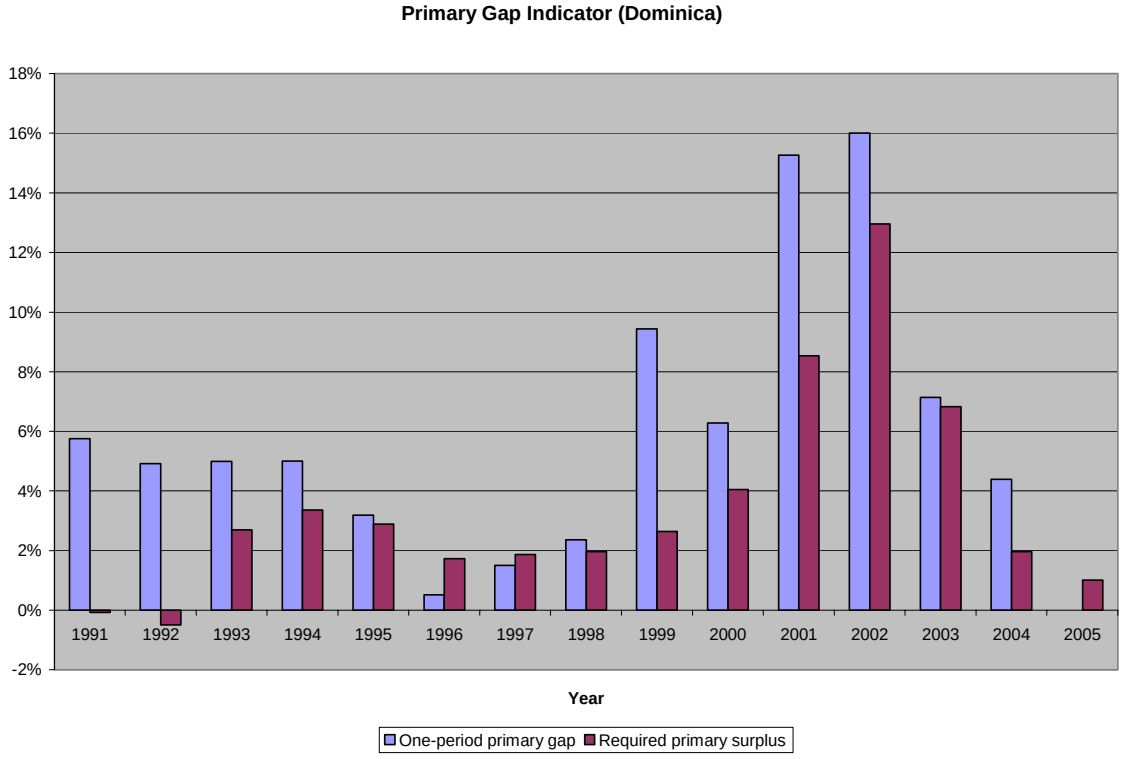


Figure 23.

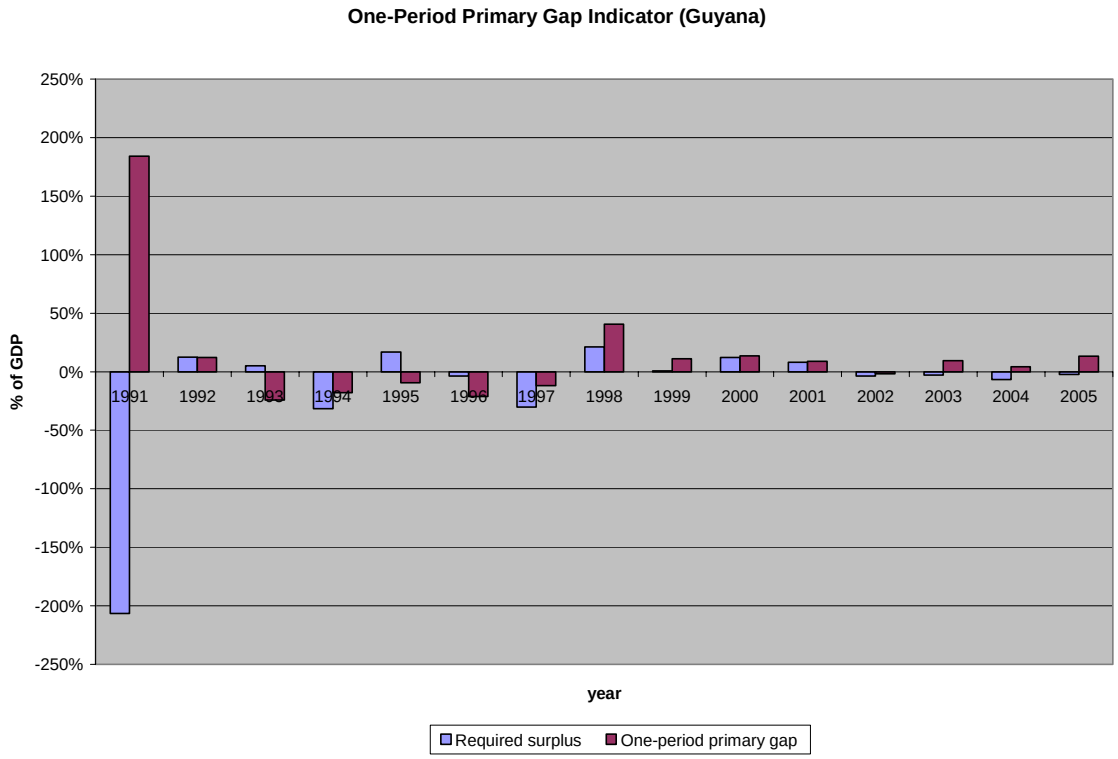

One-Period Primary Gap Indicator (Guyana)
250%
200%
150%
100%
50%
0%
-50%
-100%
-150%
-200%
-250%
% of GDP
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005
year
Required surplus
One-period primary gap

Figure 24.

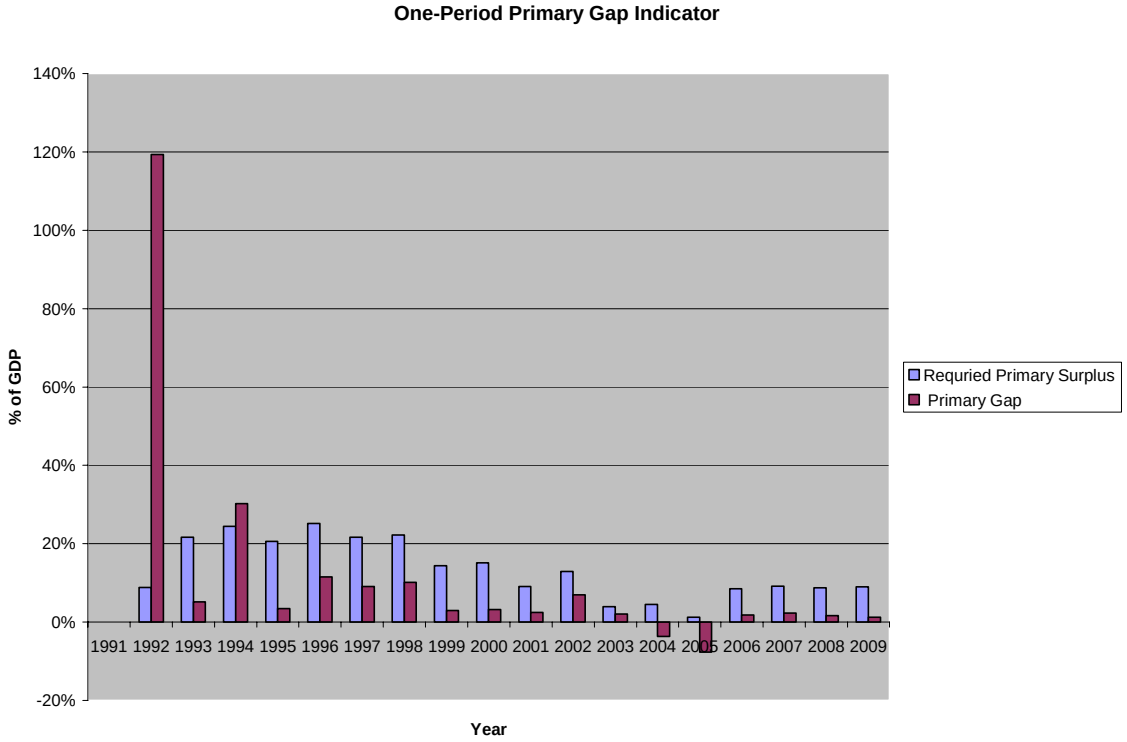

One-Period Primary Gap Indicator
140%
120%
100%
80%
60%
40%
20%
0%
-20%
% of GDP
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
Year
Requried Primary Surplus
Primary Gap

Figure 25.
Ratio of Expenditure to GDP in levels (SKN)

Figure 26.
Ratio of Revenue to GDP in levels (SKN)

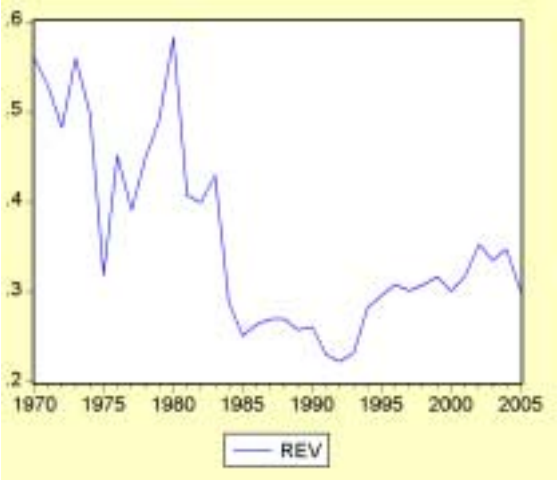


Figure 27. **First differenced Series (SKN)**

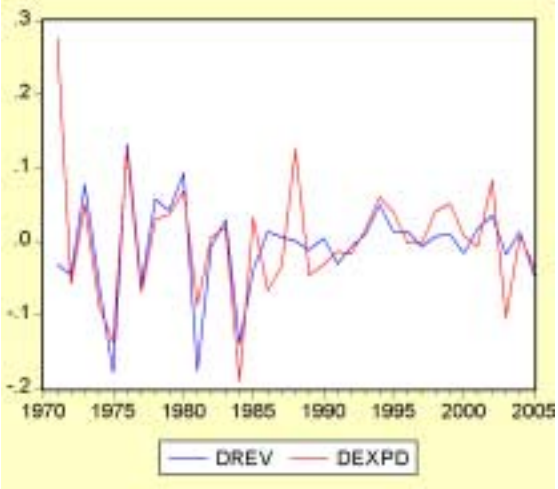


Figure 28. **First differenced Series (DOM)**

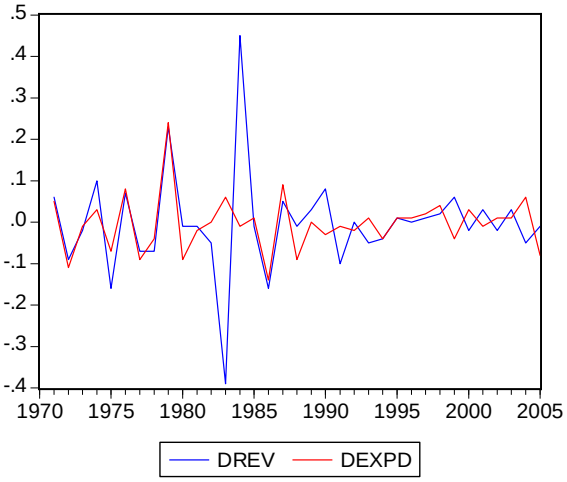


Figure 29.
Ratio of Expenditure to GDP in levels (DOM)

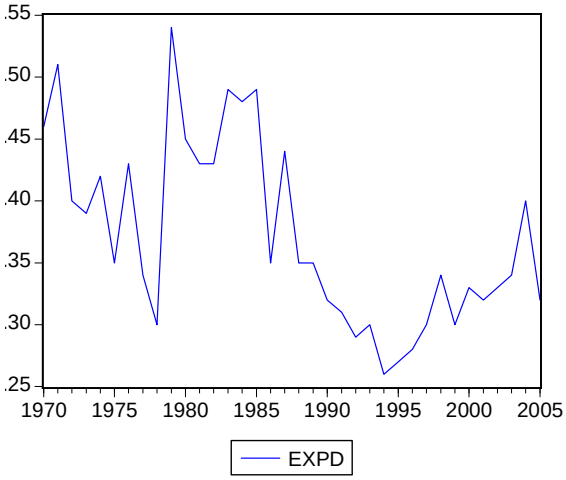


Figure 30.
Ratio of Revenue to GDP in levels (DOM)

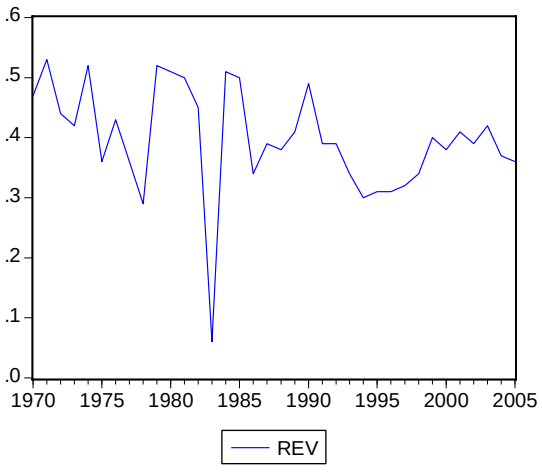


Figure 31.
Ratio of Expenditure to GDP in levels (JAM)

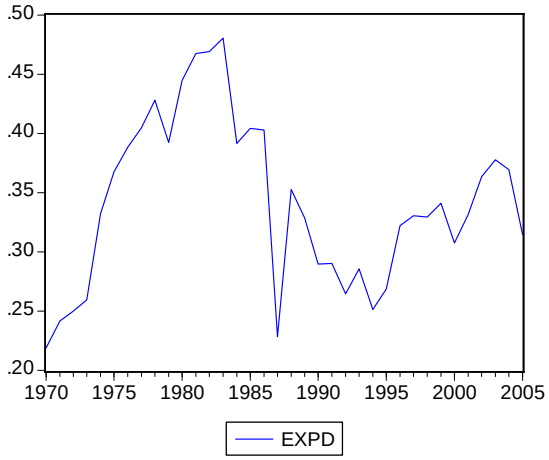


Figure 32.
Ratio of Revenue to GDP in levels (JAM)

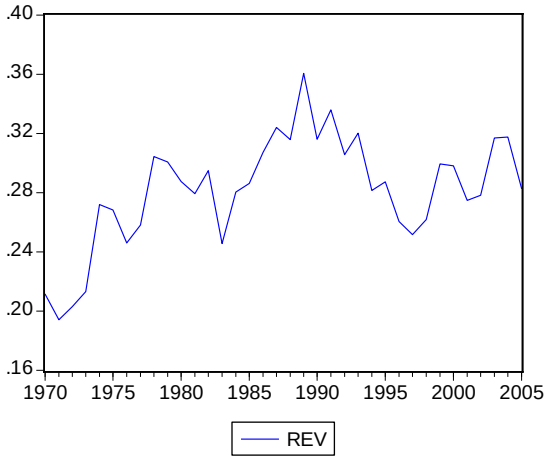


Figure 33.
First differenced Series (JAM)

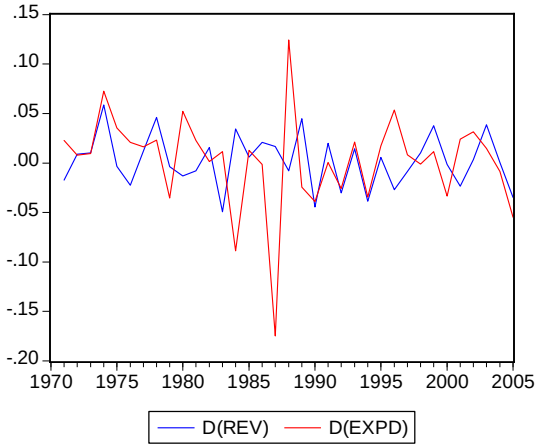


Figure 34.
First differenced Series (GUY)

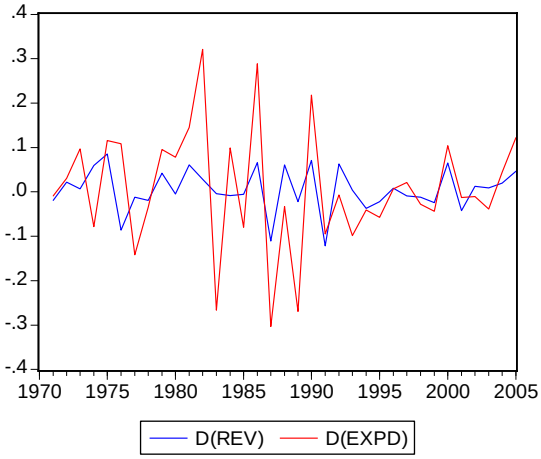


Figure 35.
Ratio of Expenditure to GDP in levels (GUY)

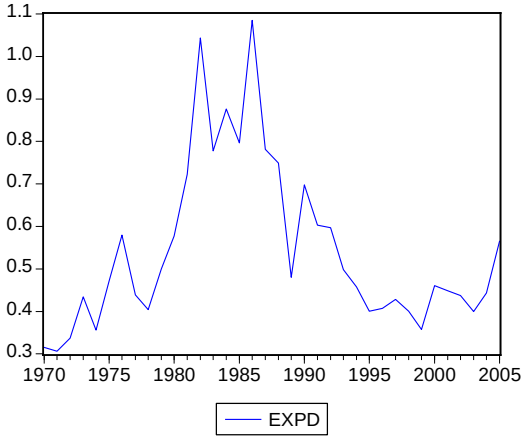
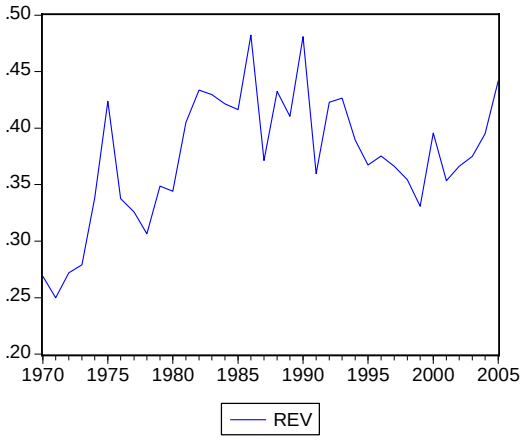


Figure 36.
Ratio of Revenue to GDP in levels (GUY)



Box 1: IMF – WORLD BANK & HIPC INITIATIVE

The HIPC initiative was proposed in 1996 as a comprehensive approach geared towards reducing the external debt of the world's poorest, most heavily indebted countries. Under this initiative, "a country can be considered to have achieved external debt sustainability if it is expected to meet its current and future external debt-service obligations in full, without recourse to debt relief, rescheduling of debts, or the accumulation of arrears, and without unduly compromising growth" (IMF, 1997).

To be considered for HIPC initiative assistance a country must: (1) face an unsustainable debt burden, beyond traditionally available debt-relief mechanisms; (2) establish a track record of reform and sound policies through IMF and World Bank supported programmes; and (3) have developed a Poverty Reduction Strategy Paper through a broad-based participatory process.

In the original framework debt was regarded as being sustainable if the ratio of Net Present Value (NPV) of debt to exports was in the range of 200-250 % or less and the ratio of debt service on exports was in the range of 20-25 % or less. For open economies with a large export base, there was also a fiscal indicator of NPV of debt to government revenues of 280 % or less.

With the Enhanced HIPC Initiative of 1999 to be eligible, a country's ratio of the NPV of debt to export must be above 150 percent. The standards have been lowered to provide deeper and broader debt relief. The benchmark thresholds are; NPV of debt to exports ratio of 150% (or, in special cases the value of debt to fiscal revenues).

In 2004, the World Bank and the IMF proposed a new debt sustainability framework. The new framework is a "forward looking" approach that aims to guide borrowing and lending decisions of low-income countries to devote resources toward achieving the MDGs, while also staying within their means to repay loans. The new approach is based on (1) the determination of country-specific debt thresholds, depending on policies and institutional quality; (2) the evaluation of the impact on the debt of external shocks; and (3) the formulation of an appropriate borrowing and lending strategy that contains the risk of debt distress.

Box 2: The Millennium Development Goals (MDGs)

The MDGs were adopted unanimously by the Millennium Summit of the United Nations General Assembly in 2000. The MDG are intended to promote human development in order to improve living conditions and address key global imbalances in poverty, hunger and disease.

There are eight goals to be achieved by 2015:

1. **Eradicate extreme poverty and hunger**
2. **Achieve universal primary education**
3. **Promote gender equality and empower women**
5. **Reduce child mortality**
6. **Improve maternal health**
7. **Combat HIV/AIDS, malaria, and other diseases**
8. **Ensure environmental sustainability**

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