

# 7

## Domestic and External Influences on Barbados' Public Debt

---

*Daniel Boamah and Cleviston Haynes*

### Introduction

Over the past twenty-five years, the nominal debt obligations issued by the central government in Barbados have increased more than thirty-fold. However, despite fiscal and external problems created by a bunching of external debt servicing payments in 1990-91 (Haynes (1997)), Barbados has not faced the severe debt overhang common to many developing countries during the 1980s and early 1990s.

Differences of opinion exist as to the cause of this debt overhang, with creditors and international financial institutions, supported by researchers like Sachs (1985), Weisner (1985) and Bulow and Rugoff (1990), tending to blame weak domestic policies such as large budget deficits, over-valued exchange rates and wasted resources on inefficient state enterprises as the proximate causes of the build-up of large and unsustainable external current account deficits. On the other hand, debtors tend to place emphasis on external factors, citing unanticipated shocks to the international financial system, the adverse shift in terms of trade, weak export markets and rising interest rates in the 1970s and early 1980s. This position has gained support in the writings of Diaz Alejandro (1984), Cline (1984) and Avery (1990).

While the debate about the proximate causes remains unsettled, there appears to be a consensus that countries which face external debt problems also incur large domestic debt obligations. When a country experiences simultaneous sharp increases in both domestic and external debt, economic growth is likely to be stunted because as Krugman (1988) argues, the servicing of rising public debt requires high tax rates which in turn discourage capital formation. When tax rates are not raised, the effect is the same because more often than not such countries run high fiscal deficits and resort to unsustainable deficit financing. They lean heavily on central bank finance, leading to excessive money creation whose

consequent inflationary pressures depress economic growth. These concerns point to the need for a comprehensive debt management policy to form an integral part of an overall macroeconomic policy in developing countries.

Barbados' public debt ratio is now almost 80% of GDP and, increasingly, new debt is incurred at short maturities and relatively high rates. This underscores the need for a coherent debt strategy as we approach the 21<sup>st</sup> century. This paper reflects on the evolution of debt, particularly in the post independence period and examines the implications for future debt management. Section 1 provides a brief sketch of earlier analysis on the Barbadian debt situation. Section 2 reviews the key influences on the accumulation of debt, utilising standard debt indicators. In Section 3 we illustrate how the terms of borrowing are changing and, using grant equivalent techniques, we provide some idea about the extra resources that went into servicing external debt as the source of funding shifted to commercial borrowing. In Section 4 we define the parameters for future debt strategies for achieving sustainable growth objectives.

## 1. Literature Review

The proliferation of writings on the Barbadian economy over the past twenty-five years has paid little attention to the issue of debt. This is perhaps not surprising when one considers Barbados' colonial experience in which reserves were accumulated to maintain spending in bad years. As a result, during the 1940s and 1950s debt was not an issue for the Barbadian economy as evidenced in Howard (1979, 1987) who critiqued colonial fiscal policy, arguing that its inherent conservatism prevented any significant increase in debt, external or internal. Beginning in the 1960s, however, there was a shift towards deficit financing in the Caribbean. The initial bias was towards foreign borrowing but, as regional countries began to experience foreign exchange difficulties, Bourne (1977) drew attention to the need for Caribbean countries to make greater use of domestic savings. However, he recognized the limitations imposed by thin capital markets and the risk of crowding out the private sector.

The growth of public sector debt in Barbados has prompted two main surveys on the contributing factors. The first by Zephirin (1980) provides a detailed analysis of the factors which led to the build-up of external debt in the 1970s, while more recently Haynes (1994) provides a similar treatment for the accumulation of domestic debt. In addition to these surveys, the work of Craigwell, Rock and Sealy (1987) identifies the increase in real government spending, shortfalls in real output and the state of the balance of payments as the crucial factors behind the trends in external debt. While Zephirin was cautiously

optimistic about government's ability to service its debts, the sharp increase in debt in the 1980s made Boamah (1988) less sanguine when he revisited the issue by examining the macroeconomic implications of alternative scenarios of debt accumulation. He argued therefore for the urgent need to raise private and public sector savings, expand exports and increase the productivity of investment. These recommendations were endorsed when the 1991 stabilization programme was implemented.

## 2. Public Debt Trends

There has been a sustained increase in Barbados' public debt<sup>1</sup> over the past twenty-five years (Table 7.1). However, different patterns appear to characterise the evolution of external and domestic debt. By 1972 the public debt ratio had risen from less than 10% of GDP in the 1950s to 30% of GDP with the share of domestic to total debt accounting for 69% of all debt. While the overall debt ratio rose gradually between 1971-80, there was little change in the external debt ratio and domestic debt's share stood at 67%. During the 1980s there was an acceleration in all debt as Government incurred large fiscal deficits. The overall debt ratio almost doubled between 1980-88, but with increased reliance on foreign borrowing the external debt ratio trebled to a peak ratio of 30.6% of GDP in 1988 (Figure 7.1). Since 1988 the stock of external debt has actually declined and has been substituted by domestic debt which has more than doubled. As a result, while domestic and external debt were almost evenly divided in 1988, domestic debt now accounts for over 72% of all debt in 1996.

Fiscal deficits provide the counterpart to the increase in public debt but in the Barbadian case it is the removal of institutional constraints which provided

---

<sup>1</sup>For the purposes of this paper, public debt is narrowly defined as that incurred by the Central Government. Balance of Payments loans undertaken by the Central Bank of Barbados and the liabilities of statutory bodies are excluded from the data in Tables 1-3. The main medium-term borrowings undertaken by the Central Bank of Barbados relate to drawings of IMF resources in 1977, 1982-84 and 1992. Other short and medium-term funds were also raised by the Bank to support external liquidity.

Table 7.1. Central Government Debt  
BDS\$ Millions

Year	Domestic	External	Total
1972	71.9	32.1	104.0
1976	208.6	60.4	269.0
1980	329.3	163.9	493.2
1984	590.2	365.3	955.5
1988	821.8	817.0	1,638.8
1992	1,236.7	755.0	1,991.7
1996	1,892.6	725.8	2,618.4

*Source: Annual Statistical Digest, Central Bank of Barbados, 1996.*

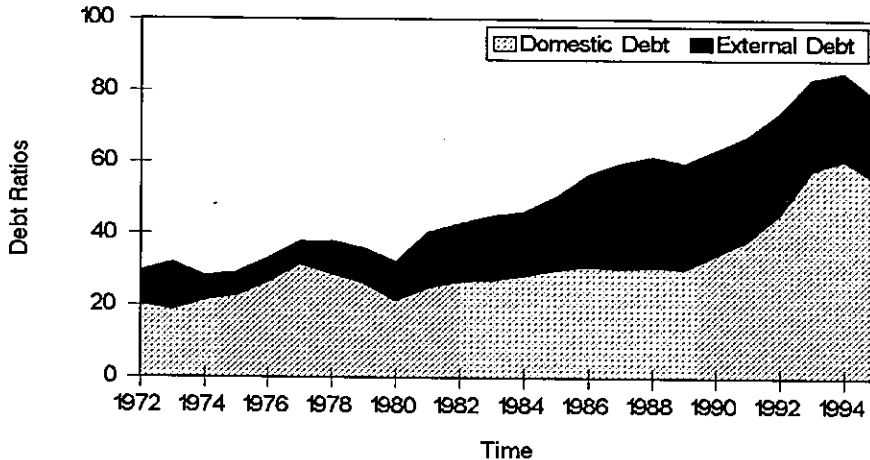
the scope for the growth of debt. Thin domestic capital markets and the inability of Government to print money effectively ruled out deficit financing as an option for Government in the 1950s and 1960s. In addition, limited access to international capital markets made it difficult to fund public sector expansion. However, accession to membership of international financial institutions like the World Bank and the Inter-American Development Bank and freer access to international capital markets reduced the constraint on foreign capital. As we see below macroeconomic developments also freed up Government's domestic financing options.

## 2.1 *Domestic Debt*

In the 1950s and 1960s, surplus funds in the domestic financial system were invested abroad but the breakdown of institutional constraints began in the 1960s when the government savings bank began to purchase local government paper *in lieu* of foreign assets. In addition, the creation of a social security scheme

Figure 7.1

## Public Debt/GDP Ratios



provided additional financing for government in the late 1960s. The Scheme accumulates large surpluses for which there are not many local investment alternatives and by 1996 it was absorbing 31.4% of the debt issue.

With the establishment of the Central Bank in 1972, government's access to domestic funding increased further as restrictions were placed on the investment of funds abroad by commercial banks. In addition, a mandatory requirement to hold government securities was imposed on banks. The removal of this capital market constraint is reflected in the fact that in 1996 commercial banks held 46.2% of Government domestic debt obligations. The Bank provided an overdraft facility and other credits to Government so as to close the financing gap when domestic or external capital markets provided insufficient resources.

The market for government paper is dominated by banks and the National Insurance Scheme but, when banks faced temporary liquidity problems, government financing was shifted onto the Central Bank via purchases of treasury bills or increases in the overdraft account. This tended to mask difficulties in refinancing domestic public debt as the Central Bank accounted for an average 21% of all Government obligations between 1973-1992. The contribution of the Central Bank increased between 1990 and 1992 when an extra-ordinarily large deficit in 1990 put pressure on international reserves and severely restricted access to international capital markets. The shift of financing to domestic sources was accommodated initially by the Central Bank before an improvement in domestic

liquidity following the introduction of adjustment policies to correct disequilibrium in the economy created increased private sector demand. By 1996, the Central Bank accounted for only 3.8% of Government's domestic debt obligations.

As part of its 1992 programme with the International Monetary Fund (IMF), government undertook to eliminate arrears between public enterprises and to rehabilitate its commercial bank by repaying the bank for debts incurred by public enterprises and the privately owned sugar industry. In general, these payments represent deferred budgetary expenditures which had enabled Government to avoid making tough policy choices in earlier years. As a result, fiscal deficits had been smaller than if these contingent liabilities had been considered earlier.

## 2.2 *External Debt*

The accumulation of external debt was influenced by the institutional factors mentioned earlier, but the pace and structure of the debt were also impacted by a number of external factors including the sharp increases in petroleum prices in 1973-74 and in 1979-80, the precipitate rise in international interest rates beginning in 1981 and the graduation of Barbados from the soft loan window of international financial institutions (IFIs) in the early 1980s.

The first oil shock resulted in a quadrupling of oil prices while the second tripled the post-1974 prices. Both contributed to massive deterioration in Barbados' balance of payments the result of increased prices for oil and other imports. The cumulative reserve loss between 1973-76 so weakened the import reserve cover that the central government and the Central Bank had to raise external funds (\$55m) between 1977-78 for balance of payments support. By the end of 1978, Zephirin (1980) estimated that the single largest component (34.1%) of the external debt was loans acquired for BOP support.

Apart from its devastating impact on the balance of payments,<sup>2</sup> the second oil shock also contributed to recession in industrial countries and reduced Barbados' foreign exchange earnings particularly from services. High interest rates introduced in industrialized countries to quell inflation created conditions for

---

<sup>2</sup>Haynes (1997) argues that the balance of payments problems during these periods were also caused by domestic factors, particularly large fiscal imbalances.

Table 7.2. External Public Debt by Category  
(Percentage Shares)  
1972-1996

Year	Bilateral	Multilateral	Commercial
1972	7.0	0.0	93.0
1976	26.7	8.1	65.2
1980	17.7	39.1	43.2
1984	18.1	44.8	37.1
1988	9.0	32.4	58.6
1996	8.5	44.9	46.6

Source: *Annual Statistical Digest, Central Bank of Barbados.*

capital outflows from Barbados. The external current account deficit rose to 12.1% of GDP. Faced with weak fiscal and external accounts, authorities raised a balance of payments support loan of \$60 million on the Euro-dollar market in 1981 and in 1982 arranged further medium term balance of payments financing totalling \$97.0 million from the IMF.

Barbados has always obtained a large portion of its foreign borrowings from commercial sources. In the mid-1970s increased reliance was placed on international financial institutions like the World Bank and the Inter-American Development Bank but the share of commercially financed debt remained significant (Table 7.2). Early commercial borrowings were directly related to capital formation, but the borrowings of the 1970s and 1980s played an important part in stabilizing international reserves.

In 1983 the illiquidity and suspension of the Caricom Multilateral Clearing Facility<sup>3</sup> and the decline of private sector related inflows placed strain on the external accounts. In addition, faced with the prospect of graduation from the World Bank and with higher debt service on previously contracted debt, Government designed a strategy to protect the balance of payments through medium-term external borrowing between 1985-88, and at the same time, to develop a track record on commercial markets. Although the actual graduation did

<sup>3</sup>For an understanding of the purpose and demise of the CMCF see Blackman (1997).

not take place until the early 1990s, Barbados was excluded from the Banks' soft loan affiliate as far back as in the early 1980s. Between 1985-87 loans totalling \$315.8 million were raised on the Japanese bond and the Euro-dollar markets and by the end of 1987 outstanding external debt was double that of the corresponding period in 1984.

When the economy's foreign exchange earning sectors stalled in the early 1990s, refinancing of these debts became problematic. New credits were costly, generally with short maturities and high interest rates. The burden is reflected in the fact that, in the three years to 1993, a total of \$547 million went out to service central government foreign debt, including approximately \$157 million in interest payments. In an effort to reduce external debt exposure and promote greater fiscal discipline the stabilization programme during this period virtually<sup>4</sup> curtailed new commercial loans between 1991 and 1993. Commercial borrowing resumed in 1994 and 1995 but the stock of debt remained relatively stable because of relatively high level of debt repayments (Table 7.3).

### 3. The Term Structure of Debt

A major feature of the evolution of debt in Barbados has been the change in the terms at which both domestic and external loans have been negotiated. As the economy became relatively more developed and more diversified, the term structure of new loans gradually took on market-related characteristics. There has been a trend towards shorter loan maturities and higher interest rates, in line with declining concessionality of new loans.

#### 3.1 *Maturity Structure*

In the 1950s when all debt was issued locally in the form of debentures, maturities ranged between 25 and 35 years. However, with the issue of treasury bills and increasing reliance on overdraft financing from the Central Bank, the maturity structure on domestic debt was biased towards short term debt. The short term ratio, which was 6.3% in 1967, peaked at 74.4% in 1984, before falling back to 63.9% in 1992. The decline in 1993 to only 50.2% reflects the large bond issue

---

<sup>4</sup>Government raised a small commercial loan of \$24m in 1993.



Table 7.3: Indicators of External Debt Service by Central Government

Year	Interest	Amortization	Debt Service	Debt Service Ratio
1972	2.0	-	2.0	0.8
1973	2.0	-	2.0	0.7
1974	5.4	2.7	8.2	2.2
1975	4.2	3.2	7.4	1.7
1976	3.1	3.6	6.8	1.6
1977	2.8	7.9	10.7	2.1
1978	3.7	9.8	13.5	2.1
1979	10.4	9.0	19.4	2.3
1980	9.9	13.5	23.4	2.1
1981	11.9	12.9	24.8	2.4
1982	18.7	12.5	31.3	2.7
1983	22.1	15.3	37.4	2.9
1984	23.4	22.6	46.1	3.0
1985	27.7	28.4	56.1	3.7
1986	40.6	36.1	76.7	5.5
1987	52.8	46.7	99.6	7.9
1988	64.1	41.3	105.4	7.3
1989	54.3	49.2	103.5	6.3
1990	61.6	136.6	198.2	12.1
1991	59.9	157.1	216.9	14.1
1992	57.5	123.8	181.3	12.0
1993	49.4	99.5	148.9	9.1
1994	50.2	86.6	136.9	7.3
1995	53.9	117.2	171.1	7.7

Source: Central Bank of Barbados, Annual Statistical Digest.

associated with rehabilitating the Government's commercial bank. In addition to changes in the short term ratio, the maturity structure of long term debt has shortened appreciably, with the average maturity falling consistently below 10 years.

In terms of foreign debt, early commercial borrowings had a relatively long maturity as did loans raised from bilateral and multilateral sources. The World Bank cites the average maturity on new commitments in 1970 as 29.6 years compared to 15.3 years in 1980. However, when commercial borrowing accelerated in 1985 and 1986 the average maturity on new loans fell below 8 years. Some of these commercial loans had to be repaid in single payments, resulting in an almost trebling of amortization payments in 1990. With the adverse impact on the external reserves, refinancing maturing debt was problematic in 1990 and 1991. IMF borrowings together with lower consumption and proceeds from privatization filled the void. The virtual cessation of new commercial borrowings between 1991-93 facilitated an improvement in the outlook for public debt payments. With the exception of a 25 year bond raised

### 3.2 *Interest Costs*

As with the maturity structure the interest costs of public debt have changed significantly. The interest rate structure on domestic securities has changed considerably to reflect market conditions. Interest rates on long term debt ranged between 3% and 4.5% in the early years, but thereafter interest rates on long term debt drifted upwards. Real rates on Government paper, as with other rates in the economy were negative during the double digit inflation period of the 1970s and early 1980s, but the slowing of inflation in recent years has enabled moderate positive real returns for investors.

Interest rates on external debt has also risen significantly as evidenced by the World Bank which indicates that the average cost of foreign borrowing which in 1970 was 3%, rose to 11.5% in 1981 when Government had to undertake its borrowings for balance of payments support at a time of very high interest rates. The shift to commercial financing kept the average cost of funds between 7% and 8% between 1985 and 1989, reflecting the varied use of funds from Japanese, sterling and Eurodollar markets. Commercial borrowings during the 1990s have tended to ratchet up the costs of funds as new commitments in 1990, 1991 and 1994 carried costs in excess of 10%. With the increase in the stock of debt and rising interest rates, interest costs have begun to absorb an increasing share of Government revenue. Given slow revenue growth the ratio exceeded 16% in FY 1992-93 and FY 1995-96. This represents a cost equivalent to 5.3% in

FY 1995-96 compared to 3.5% in FY 1989-90. Domestic interest costs have risen from 6.8% of revenue in FY 1989-90 to 11.4% in FY 1995-96, while foreign interest costs have been declining, absorbing only 5.0% of revenue compared to 5.4% in FY 1989-90.

### 3.3 *Grant Element*

The tendency for official creditors to provide long-term funds at relatively low interest rates is often interpreted as a type of grant to borrowing countries. Shifting to commercial loans with shorter maturities and higher rates imposes higher costs on borrowing countries. Such loans are undertaken to provide residual counterpart financing where capital projects are costly and domestic savings are inadequate. Given the changes in the maturity structure and interest rates for foreign debt we provide illustrative estimates of the additional costs imposed by commercial borrowings (Table 7.4) between 1982-1990. We have attempted to measure the extent to which the main commercial borrowings during this period may have resulted in an increase or decrease in the grant element of external borrowing. The grant element generally measures the degree of concession of a given loan and it is defined as the difference between the face (or commitment) value of the loan and the discounted present balance of a contractual debt service. (See the appendix for the formulae used in the calculations). By convention, the discount rate should reflect the real productivity of capital in the economy, a measure that is not easily calculated. In this paper the market interest rates<sup>5</sup> existing at the time when the loans were contracted have been utilized<sup>6</sup> as the discount rate. While they are approximations, we reckon that they reasonably represent the opportunity cost of the loans at the time the contracts were signed.

In Table 7.4 we bring together the results of the calculation of the grant elements of ten central government loans negotiated on the international capital

---

<sup>5</sup>The market interest rate is defined here as the London Interbank Offer Rates (LIBOR) on US dollar deposits for one year or more during the year when the loans under review were negotiated. However, for the BZW loan, the yield on UK government long-term bonds was used (as the discount rate) in view of the very long maturity (25 years) of that loan.

<sup>6</sup>The World Bank conventionally discounts future debt service payments at 10%.

Table 7.4: Estimates of the Grant Elements of Selected International Market Loans

Creditor	BDS Q(\$m)	r(%)	r <sub>o</sub> (%)	t	b	I(%)	GE (%)	Geo (%)
RBC(83)	26.0	10.7	8.1	4.0	1.0	10.2	-1.6	6.2
YENBN(85)	40.0	7.7	7.9	0.08	5.0	9.1	7.0	6.0
NATWST(85)	50.0	11.2	7.9	3.0	4.0	9.1	-11.9	6.4
NATWST(86)	80.0	11.2	8.0	3.0	4.0	7.0	-26.0	-6.0
YENBN(86)	55.8	6.9	8.0	0.17	5.0	7.0	0.3	-5.6
BARCLYS(87)	90.0	9.9	8.0	2.5	4.0	9.8	-0.7	9.0
YENBND(88)	80.4	6.8	8.0	4.0	6.0	8.4	11.8	3.1
SMONTAGU(89)	50.0	11.5	5.3	4.0	3.0	9.3	-12.2	19.8
CITIBANK(90)	40.0	9.6	6.5	2.0	3.5	8.5	-6.8	11.1
BZW(90)	111.0	13.5	6.5	0.08	24.9	14.7	14.8	84.9

Note: r<sub>o</sub> represents the average interest rate chargeable on official bilateral and multilateral loans to Barbados.

Ge<sub>o</sub> represents the estimated grant element on the loans should they have been negotiated at official interest rates.

Please see the appendix for the definitions on the other variables.

markets over the period 1983 to 1990. The results suggest that the grant elements were negative for seven of the loans, with the 1988 Yen bond placement providing the most favourable terms and the 1990 Barclays de Zoett Wedd (BZW) loan the least. The weighted average grant element for these loans is estimated at around 16.5%. During the same period, if these loans had been contracted at official rates, the grant elements would have averaged 15.6%. The range of the estimated grant elements (-15.6% to 15.6%) suggests that Barbados would have paid approximately 30% less in interest payments if it had used multilateral loans. If consideration is given to the fact that more favourable maturity periods would have been possible under official (multilateral) loans, the gains would be much higher.

#### 4. Towards Future Debt Management Strategy

The foregoing analysis indicates that Barbados has had a significant accumulation of debt in recent years, measured at about 80% of GDP in 1996. This high level of public debt has not given rise to default, but it does raise concerns if the debt ratio rises over time. In particular, as evidenced by the impact of the current debt stock on the share of revenue absorbed by interest costs, the persistence of a large debt stock will tend to crowd out public expenditures, especially for capital formation. Minimizing the interest costs of public debt must therefore form a critical element of future debt management strategy. Domestic conditions, particularly the fiscal deficit, will influence the achievement of this objective. The Barbadian experience of 1991-92 gives indication of the problem which unsustainable fiscal deficits could create, especially in an environment of declining foreign exchange reserves. In contrast, low deficits reduce interest costs by containing the rate of increase of debt and by avoiding pressure on interest rates. This is relevant in both domestic and foreign international markets. The rates at which a country can borrow on international markets are influenced by existing market conditions and the risk associated with the borrower. The commercial borrowings are influenced by the credit rating assigned to the borrower by international rating agencies. As domestic conditions improve, the costs of acquiring funds will improve.

The high level of debt with short maturities creates the risk of refinancing difficulties. This may be aggravated by conditions in external markets which may differ from domestic conditions. A sustainable debt strategy therefore needs to act in concert with monetary and fiscal policy as one of the tools of macroeconomic stabilization. It is therefore essential that debt management be seen as an integral part of macroeconomic policy. This should involve a reduction in the debt ratio, an achievable objective if fiscal deficits are kept small in the context of a growing economy. The notion of fiscal policy to stimulate the economy is not sustainable because it tends to put pressure on the Central Bank's reserves.

The debt strategy must take account of the maturity structure for domestic and foreign loans. The effects of maturing debt on the economy's reserves will be mitigated by avoiding a bunching of debt. Similar principles need to be applied to domestic debt for difficulties in refinancing external debt may coincide with strong domestic demand, thus creating problems to increase domestic debt issue independent of the Central Bank. Debt management strategy also needs to focus on ways to shift the financing of fiscal deficits away from the Central Bank and more towards the private sector. It is in this context that a well developed and

functioning money and capital market becomes another essential element of debt management strategy.

There is a tendency to use foreign borrowing to help finance burgeoning fiscal deficits. Access to concessional funds are declining, suggesting the need for greater use of commercial loans. International markets conditions are favourable to borrowers at this time but there is the danger that excessive use of this opportunity could push the foreign debt component beyond manageable limits. Apart from foreign debt servicing concerns, Barbados' own experience in 1991-92 suggests that international market conditions may not always be favourable for refinancing maturing foreign debt. Moreover the better strategy is to keep the foreign debt service relatively low so that the country would be better able to borrow externally against unanticipated economic shocks without difficulty and without too much damage to its macroeconomy. This underscores the need to keep the mix between domestic and external debt under close scrutiny.

## 5. Conclusion

Barbados has a relatively high debt ratio, the result of the accumulation of fiscal deficits over the past twenty-five years. While the early deficits helped the economy to expand, the debt indicators suggest the urgency for a sustainable debt management. Foreign debt has fallen to manageable levels in the context of the economy's medium term capacity to service foreign loans, but the interest costs of servicing domestic and external debt out of tax revenue is beginning to crowd out other expenditures. Avoiding this requires macroeconomic conditions conducive to low interest rates. This suggests the need for low fiscal deficits. In addition, while Barbados has traditionally relied heavily on commercial financing, it seems that increasing reliance will be needed in the medium-term as international financial institutions seek to divert financial resources to economies with lower per capita incomes. The shorter maturities associated with commercial loans together with the volatility of commercial interest rates and international market conditions underscore the need for fiscal prudence over the medium-term if debt is not to act as a constraint on long-term economic activity.

## Appendix

### Calculation of the Grant Element

Suppose a country has received a loan which has to be paid in  $t$  years. Then the position when the loan has been fully repaid at the end of  $t$  years may be given as (1) (see Mahmood (1977)). From that the annual installments ( $A$ ) may be estimated with equation (2). Equation (3) in turn is the present discounted value of the annual payments. Similarly the grant element of the loan is derived from equation (4).

$$Q (1+p)^b (1+r)^t + \frac{A}{r} [1-(1+r)^t] = 0 \quad (1)$$

$$\text{or} \quad A = \left[ \frac{rQ(1+p)^b(1+r)^t}{(1+r)^t - 1} \right] \quad (2)$$

$$PV = \frac{A}{i(1+i)^b} \left[ 1 - \frac{1}{(1+i)^t} \right] \quad (3)$$

$$\text{and} \quad GE = \frac{(Q-PV)}{Q} 100 \quad (4)$$

### Notations

- Q: the amount of the loaned principal
- p: the rate of interest during the grace period
- b: the grace period in years
- r: the rate of interest
- A: the equal annual instalments of debt servicing on the loan

- t: the repayment period of the loan  
i: the discount rate  
PV: the percent discounted value of the annual instalments  
GE: the grant element of the loan

### References

- Avery, William, The Origins of Debt Accumulation among LDCs in the World Political Economy, *Journal of Developing Areas*, Vol. 24, No. 4, July 1990, pp. 503-522.
- Blackman, Courtney, The Practice of Central Banking in Barbados: An Interpretation of the First Fifteen Years, Codrington, H., Craigwell, R. and Haynes, C. (Editors), *Central Banking in Barbados: Reflections and Challenges*, Bridgetown: Central Bank of Barbados, 1997.
- Boamah, Daniel, Some Macroeconomic Implications of External Debt for Barbados, *Social and Economic Studies*, Vol. 37, No. 4, December 1988, pp. 182-191
- Bulow, Jeremy, and Rogoff, Kenneth, Cleaning Up Third World Debt without Getting Taken to Cleaners, *The Journal of Economic Perspectives*, Vol. 4, No. 1, Winter 1990, pp. 31-42.
- Bourne, Compton, Current Trends and Problems in Domestic Debt Financing of Caribbean Governments, *Social and Economic Studies*, Vol. 26, No. 4, Special Number, December 1977, pp. 412-431.
- Cline, Williams, *International Debt: Systematic Risk and Policy Response*, Economics, Washington, D.C.: Institute of International Economics, 1984.
- Craigwell, Roland, Rock, Llewyn and Sealy, Ronald, On the Determination of the External Public Debt. The Case of Barbados, *Social and Economic Studies*, Vol. 37, No. 4, December 1988, pp. 137-150.



- Diaz-Alejandro, Carlos, Latin American Debt: I Don't Think We are in Kansas Anymore, *Brookings Papers on Economic Activity*, No. 2., 1984, pp. 335-403.
- Haynes, Cleviston, Domestic Debt Management: The Barbadian Experience, paper presented at the XXXI Meeting of CEMLA Technicians, Santiago, Chile, November, 1994.
- Haynes, Cleviston, Lessons from Barbados' Experience with the International Monetary Fund, Codrington, H., Craigwell, R. and Haynes, C. (Editors), *Central Banking in Barbados: Reflections and Challenges*, Bridgetown: Central Bank of Barbados, 1997.
- Howard, Michael, *The Fiscal System of Barbados: 1946-1965*, Occasional Paper No. 12, Cave Hill: University of the West Indies, Institute of Social and Economic Research, 1979.
- Howard, Michael, *Dependence and Development in Barbados: 1942-1985*, Bridgetown: Carib Research and Publications Inc. Barbados, 1987.
- Mahmood, M.A., An Estimation of Grant Element in Foreign Aid, *The Pakistan Development Review*, Vol. XVI, No. 1, 1977, pp. 1-16.
- Sachs, Jeffrey, External Debt and Macroeconomic Performance in Latin American and East Asia, *Brookings Papers on Economic Activity*, Vol. 2, 1985, pp. 523 - 564.
- Weisner, E., Latin American Debt: Lessons and Pending Issues, *American Economic Review*, Vol. 75, 1985, pp. 191-195.
- Zephirin, Mary G, The External Debt of Barbados, *Central Bank of Barbados, Economic Review*, Vol. VII, No. 4, December 1980, pp. 24-67.

