



## Current Account Sustainability in Jamaica

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### Abstract

This paper evaluates the sustainability of Jamaica's current account positions over the period 1962 to 2002 as well over the medium term. An intertemporal model of sustainability is employed for the historical data, while the traditional accounting and present value approaches are used to evaluate the prospects for the current account. The historical current account balances were, in general, above optimal, and as such they did not breach the solvency condition for sustainability. Notwithstanding, there were periods of chronic imbalances that precipitated dramatic reversals in policy and/or investor sentiment. The outlook suggests that the economy's net external liabilities will grow, with the risk of investors perceiving the trend as unsustainable. The paper also considers the sustainability of transfers, an important component of the Jamaican current account. The tentative view is that these inflows will continue, but there are risks to their long-term vibrancy.

Keywords: sustainability, current account

JEL Classification: **F32, F41**

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## **1.0 Introduction & Motivation**

The deficit on the current account of Jamaica's balance of payments (BOP) has grown progressively since 1962 to 14.0 per cent of gross domestic product (GDP) in 2002. This deterioration, particularly in the latter part of the 1990s and the early 2000s, was in the context of fairly large fiscal deficits, and the emergence of private sector dissavings since 2000. The level and persistence of the imbalance has generated significant interest in the issue of the sustainability of Jamaica's current account deficit.

This paper assesses the sustainability of the Jamaican current account using an inter-temporal model of current account determination, as well as more traditional methods of evaluating the path of a country's net external liabilities. Although this issue is critical to small open economies, it has never been investigated empirically for Jamaica.

Current account deficits are considered sustainable if their levels, as well as their time paths, do not precipitate a sudden reversal in capital flows or necessitate dramatic adjustments in macroeconomic policy. Conventional wisdom suggests that deficits above 4.0 – 5.0 per cent of GDP are unsustainable. However, external sustainability cannot be assessed by appealing to rudimentary benchmarks. Countries such as Australia, Israel and Ireland were able to sustain current account deficits above this threshold for several years. Conversely, other countries, such as Chile and Mexico, have experienced severe external crises in the context of an external position that is not severely deteriorated.

A number of factors must be considered when assessing current account sustainability for individual countries. In particular, the intertemporal solvency of a country must be considered. That is, can the country generate sufficient trade surpluses in the future to repay existing debt? Does the deficit reflect high consumption spending, or does it reflect emerging buoyancy in the real sector?

The analysis suggests that the Jamaican current account did not breach the inter-temporal condition for sustainability over the period considered, but reveals that deviations from

equilibrium were quite pronounced in the latter part of the sample. First generation models of sustainability also suggest that the passively projected path of selected macroeconomic variables over the medium term will not result in the stabilisation of the economy's net external liabilities. For example, GDP growth would have to accelerate from the current target of between 3 and 4 per cent over the medium term, to an average of 16.0 per cent, in order to avoid further growth in Jamaica's net external liabilities. In this context, the goods and services balance (including transfers), as a per cent of GDP, would have to improve from the passively projected average deficit of 3.5 per cent of GDP, to an average **surplus** of approximately 37.0 per cent of GDP.

The growth in migrant remittances between 2000 and 2002 as well as the relative size of net transfer inflows suggest the importance of these flows to the overall sustainability of the Jamaican current account. In evaluating the factors that are commonly thought to be important determinants of migration, and hence remittances, we find that push factors such as income growth and the incidence of crime are most important in affecting peoples decision to leave Jamaica, relative to the pull factors such as economic growth in the United States of America (USA). Jamaicans are principally employed in two major states in the USA, and they are largely engaged in service related industries, which tend to grow faster than the goods producing sectors. The changing population structure in the United States indicates that demand for selected services will remain buoyant in the foreseeable future. However, the trend in migration suggests that entire families have been leaving Jamaica, relative to previous incidences where only the head of the household migrated.

The overriding conclusion therefore is that Jamaica will continue to benefit from migrant transfers, but possibly at a reduced rate of growth. Given the changing pattern of migration, as well as the fact that the recent acceleration in the growth rate of remittances was, in part, related to improved data capture, there are risks that the growth in migrant remittances could even taper off. This is compounded by the risk of further adverse changes in the immigration laws in the major industrialised countries.

The assessment of the Jamaican current account points to the need for fairly dramatic and immediate adjustments in macroeconomic and structural policies. Fiscal policy adjustments are clearly mandatory, but there is a need for initiatives aimed at stimulating relatively large growth in the real sector, targeted principally at tradable goods and services. To the extent that growth in remittances can be encouraged, this would also be desirable.

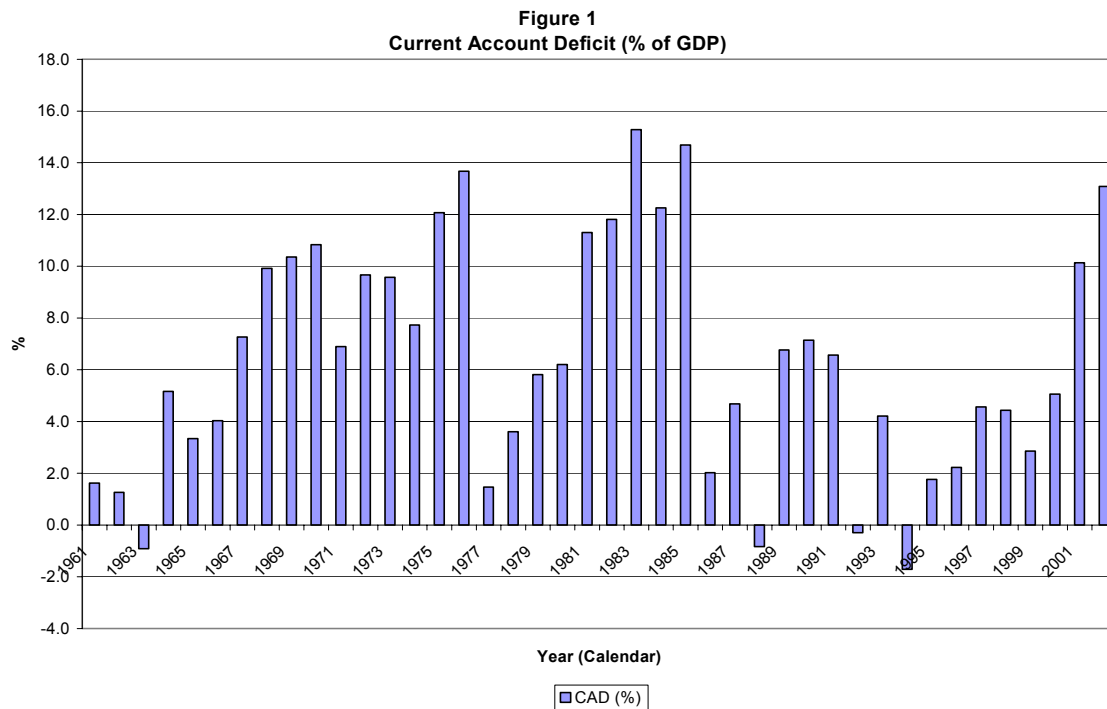
The remainder of the paper proceeds as follows: Section two discusses the evolution of Jamaica's net external position since 1962, while section three reviews the theoretical sources of current account deficits. The fourth section evaluates the sustainability of the deficit in the context of an inter-temporal model, while the fifth uses first generation models to assess the future path of the economy's net external liabilities. Given the importance of current transfers to the current account, section six evaluates the sustainability of these flows. The final section concludes and offers some policy recommendations.

## **2.0 The Evolution of the Jamaican Current Account**

Jamaica can be classified as having a persistent current account deficit. The average deficit between 1962 and 2002 was 6.4 per cent of GDP, which compares adversely with the average current account deficit of 1.0 per cent of GDP for selected emerging market economies between 1972 and 2001 (see table 1, appendix). The performance of the Jamaican current account can be evaluated over five broad periods: 1962 to 1970, 1971 to 1976, 1977 to 1985, 1986 to 1994, and 1995 to 2002.

In the period leading up to 1970, the current account deficit averaged 5.7 per cent of GDP, growing from 1.3 per cent of GDP in 1962 to 10.8 percent of GDP in 1970 (figure 1). Economic policies at that time focused on the promotion of rapid economic growth with the aim of achieving self-sufficiency. Significant capital goods were imported to facilitate the expansion of the bauxite and tourism industries, which contributed to the widening of the deficit. Given the narrowness of the export base at the time, growth in

earnings was relatively low. In this context, the goods and services balance fell from 0.3 per cent of GDP in 1962 to a deficit of 5.4 per cent of GDP in 1970. The deficit over this period was largely financed by large inflows of foreign direct investment, in the context of relatively favourable international conditions and domestic incentives.



During the period 1971-1976, the current account maintained its negative trend with the deficit averaging approximately 10.0 per cent of GDP. The economy was adversely affected by international shocks over the period. In particular, there was a significant increase in oil prices in 1973. In addition, domestic production lagged in crucial sectors and private foreign investment declined. The mining sector was adversely affected by the efforts of the Government at rationalizing the existing tax structure for the industry. Moreover, a recession among Jamaica’s major trading partners served to depress earnings from tourism. These factors contributed to high levels of unemployment and overall negative growth. In this context, there were expansions in the fiscal deficit and a substantial increase in the national debt.

In 1977, Jamaica entered into a Standby Agreement with the International Monetary Fund (IMF) for approximately US\$75.0 million. This arrangement was aimed at reducing Government's non-IMF borrowing requirements and rebuilding the NIR through tightened demand management policies involving, inter-alia, quantitative restrictions on imports and an intensification of exchange controls. A new exchange rate regime was also introduced which entailed a depreciation in the exchange rate for selected transactions. The net result of these initiatives was a significant reduction in the current account deficit to 1.5 per cent of GDP in 1977 from 13.7 per cent the previous year. However, the current account deteriorated substantially thereafter, to peak at an all-time high of 15.3 per cent of GDP in 1983. This decline had its genesis in a second significant oil price shock of 1979, which culminated in a world recession, precipitating a fall in exports and increases in import prices.

The policy focus by 1986 was on increasing foreign exchange earnings through higher exports, containing aggregate demand and stabilizing the exchange rate. Consistent with this thrust, earnings from goods exports and tourism receipts increased substantially, reflected in a significantly lower deficit of 2.0 per cent of GDP in 1986, relative to 14.7 per cent of GDP in 1985. A small current account surplus was attained in 1988, influenced by large inflows of reinsurance funds relating to the damages sustained by the economy from a major hurricane. In addition there were increases in transfer receipts to both the official and private sectors.

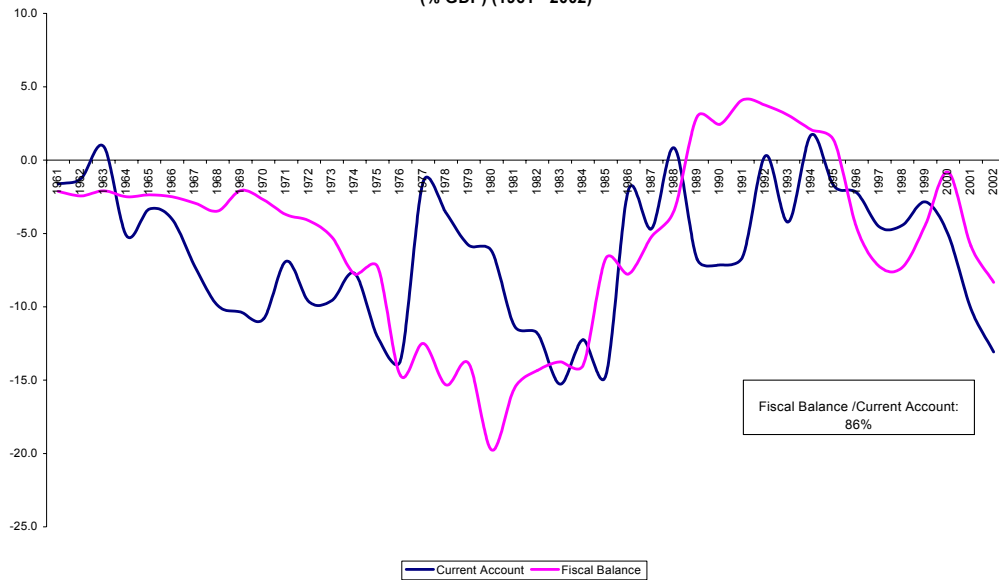
Between 1992 and 1996, the current account deficit averaged a modest 1.2 percent of GDP. This better than average performance was due to the liberalization of the foreign exchange market and the opening of the capital account in the early 1990s, which had two effects. In the first place, substantial depreciation of the nominal exchange rate, particularly between 1991 and 1994, facilitated both an improvement in export growth and a moderation in imports. Secondly, the ensuing acceleration in inflation necessitated a significant tightening in monetary policy, which helped to address some of the

macroeconomic imbalances within the economy, and also induced substantial capital inflows.

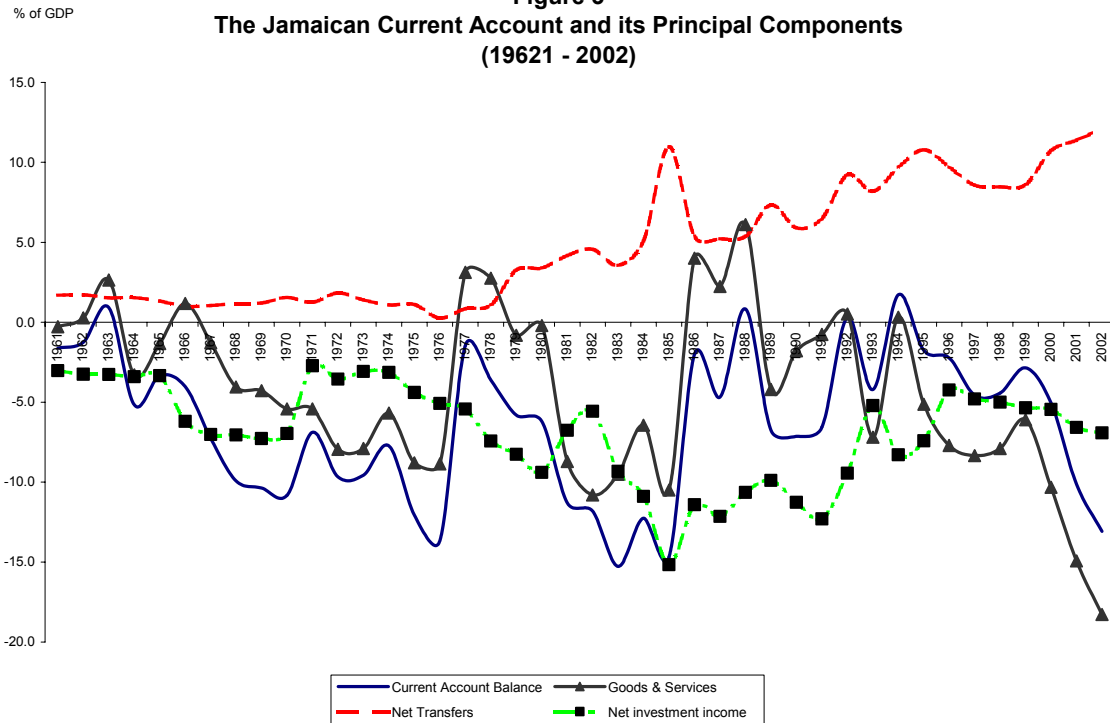
The current account deficit deteriorated progressively to 14.0 per cent of GDP in 2002 from 4.6 per cent of GDP in 1997. Declines in non-traditional exports, particularly garments, in conjunction with a rapid growth in consumer imports, fuelled the widening of the deficit. The trend deterioration was also underpinned by incipient fiscal deficits, as well as the emergence of private sector dissavings in 2000. For the period 2000 – 2002, total private sector dissavings averaged 4.4 per cent of GDP, compared with an average savings rate of 2.4 per cent of GDP between 1996 and 1999. The private sector dissaving between 2000 and 2002 partly reflected increased foreign direct investment inflows in telecommunications, banking and finance, electricity generation and the tourism sector, in the context of an aggressive programme of divestment by the Government. Towards the end of the period, the economy was severely affected by a number of shocks including adverse weather conditions, the terrorist attack on the USA, a fallout in the mining sector, and adverse changes in the terms of trade facing the country. A mild recession among the major industrialized economies, as well as counter cyclical fiscal policies, also contributed to a widening of the deficit.

In broad terms, the principal source of the current account imbalance between 1962 and 2002 was the level of fiscal dissavings. Over the four decades, fiscal deficits contributed approximately 86.0 per cent of the current account deficit. More recently, fiscal imbalances contributed, on average, approximately 90.0 per cent of the current account deficits (see figure 2). From the perspective of the components of the current account, net interest income payments have reflected the largest deficits. As a percentage of GDP, this sub-account averaged approximately 6.8 per cent of GDP between 1961 and 2002, with the share increasing to 7.1 per cent of GDP in the last decade. Concurrently, the trade deficit increased to 6.7 per cent of GDP between 1990 and 2002, relative to an average of 4.3 per cent of GDP over the four decades (see figure 3).

**Figure 2**  
**Jamaica: Current Account Imbalances and Government Dissavings**  
 (% GDP) (1961 - 2002)



**Figure 3**  
**The Jamaican Current Account and its Principal Components**  
 (19621 - 2002)



In the context of the persistent current account deficits over Jamaica's recent history and, in particular, the emergence of a large imbalance in 2002, concerns have been generated

about the sustainability of Jamaica's external accounts. These concerns were amplified by the potential impact of these imbalances on the foreign exchange market and the broader macroeconomy.

### **3.0 The Concept & Sources of Sustainability**

Mann (1999) defines a current account deficit as being sustainable when it does not generate economic forces that will result in a change in its path. In other words, a current account balance is sustainable when the continuation of the current policy stance will not require a "drastic" shift or a "sudden stop" (e.g. a sudden tightening of monetary and fiscal policy, causing a large recession), or lead to a "crisis" (e.g. sharp increases in interest rates, a sudden depletion of the reserves, or an exchange rate collapse). A large current account deficit may cause a shift in investor confidence and a reversal of international capital flows, as they fear loans will not be repaid. Holman (2001) highlighted, however, that a large current account deficit is not the sole propagating factor behind dramatic reversals in capital flows. Countries with large current account deficits have benefited from significant external investments because the growth prospects for these countries are usually good. Milesi and Ferreti (1996) relates sustainability to the solvency of the economy which, however, does not relate explicitly to the issue of investor confidence.

#### **3.1 Sources of Current Account Unsustainability**

The current account ( $CA$ ) is usually decomposed into the trade balance, that is the net exports of goods and services ( $X-M$ ), the factor income balance, which includes investment income paid to and received from foreigners on foreign assets ( $rB$ ), and current or unilateral net transfers such as remittances sent home by migrant workers ( $Tr$ ).

$$CA = X - M + rB + Tr \quad (1)$$

Current account deficits are typically financed by foreign direct investment (FDI), net foreign borrowing of both the Government and the private sector (NFB), or a reduction in a country's net foreign assets ( $\Delta NFA$ ).

$$CA = - (FDI + NFB - \Delta NFA) \quad (2)$$

The right hand side of this BOP equation can be expressed as  $B_t - B_{t-1}$ , where  $B_t$  is the country's international investment position (IIP).

The current account can also be viewed as the difference between the savings (S) and investment (I) of Government (g) and domestic private agents (p).

$$CA = (S_p - I_g) + (S_g - I_p) = S - I \quad (4)$$

Expression (4) highlights that a current account deficit typically results from dissavings by either the private or public sector. Assessments of current account sustainability cannot, however, only focus on the difference between investment and savings, but should also examine the absolute level of both variables. A current account deficit that is the result of low domestic savings is less likely to be sustainable than a current account deficit that is the result of high investment. Higher levels of investment increase the economy's production capacity, which, in general, increases future output and trade surpluses. It is important to note that the composition of investment determines the extent of the translation of economic activity into trade surpluses. If investments are allocated proportionally more towards tradable goods, then the additional output will generate trade surpluses.

#### **4.0 Measuring the Sustainability of the Current Account Deficit**

There is a commonly held view that current account deficits in excess of 5.0 per cent of GDP are excessive. This "benchmark" was initially mooted by Summers (1996), when he

noted that, “close attention should be paid to any current account deficit in excess of 5.0 per cent of GDP, particularly if it is financed in a way that leads to rapid reversals.” The issue of benchmarks was revived in the aftermath of the Asian financial crisis, when Corsetti, Pesenti and Roubini (1998) and Radelet and Sachs (2000) suggested that the countries that came under attack appeared to have been those with “large” current account deficits throughout the 1990s<sup>2</sup>.

In the wake of rather ad-hoc views about sustainable current account deficits, analyses of current account sustainability have become popular among investment banks. Goldman-Sachs developed the GS-SCAD model in 1997 to assess “vulnerabilities” in emerging nations. More recently, Deutsche Bank (2000) developed a model of current account sustainability to both assess the sustainability of the current account position and to evaluate the appropriateness of the country’s real exchange rate. The principal conclusion of the Deutsche Bank (2000) assessment was that there is a wide variety of estimated long run “sustainable deficits”. With the exception of China – whose estimated sustainable deficit was an improbable 11 per cent of GDP – the estimated levels were very modest and fell in the range 1.9 per cent to 4.5 per cent.

#### ***4.1 Dynamic Benchmarks***

Analyses of the sustainability of current account imbalances should take into consideration the question of whether particular current account imbalances are excessive, relative to an optimal benchmark. Inter-temporal Benchmark Models (IBMs) of the type suggested by Obstfeld and Rogoff (1995) yields predictions about the “equilibrium” or “optimal” path of external imbalances. Actual balances can then be compared to this benchmark to determine whether they have been excessive or not.

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<sup>2</sup> For Malaysia, the average current account deficit between 1990 and 1996 was 5.2 per cent of GDP, while the current account deficit for Thailand over the same period was 8.7 per cent.

IBMs have at their core an infinitely lived representative consumer who maximizes an inter-temporal consumption function  $E_t \sum_{j=0}^{\infty} \beta^j u(c_{t+j})$ ,  $0 < \beta < 1$ , subject to her budget constraint  $\Delta b_{t+1} = rb_t - (y_t - c_t - i_t - g_t)$ .  $c_t$  is private consumption,  $U(\cdot)$  is a separable utility function where  $u' > 0$ ,  $u'' < 0$ <sup>3</sup>,  $\beta$  is the subjective discount factor and  $E_t$  is the expectations operator.  $b_t$  denotes the economy's stock of net external liabilities at the beginning of period  $t$ ,  $y_t$  denotes real gross national income (GNI)<sup>4</sup>,  $i_t$  is real investment, and  $g_t$  is real government consumption.  $r_t$  is the interest rate on the economy's net external liabilities<sup>5</sup>.

The optimal level of consumption ( $c_t^*$ ) is given by the following:

$$c_t^* = (r/\Theta) \left[ -b_t + (1+r)^{-1} E_t \left( \sum_{j=0}^{\infty} (1+r)^{-j} z_{t+j} \right) \right], \quad (6)$$

where  $\Theta = \frac{\beta r(1+r)}{\beta(1+r)^2 - 1}$  [ $\forall \Theta > 0$ ] under the assumption of a quadratic utility function,

and  $z_t = y_t - i_t - g_t$  is referred to as the national cash flow. Along the optimal path, private consumption depends on net wealth (the present discounted value of the expected future stream of cash flows) and the existing stock of assets/liabilities.

Given the optimal path of consumption, the optimal current account balance on a national income basis is given by the following:

$$ca_t^* = y_t - i_t - g_t - \Theta c_t^* \quad (7)$$

The consumption tilting parameter ( $\Theta$ ) captures that portion of the current account that would occur if the national cash flow was at its permanent level.  $\Theta$  reflects the

<sup>3</sup> A quadratic utility function is assumed:  $u(c_t) = c_t - c_t^2/2$ . This approximation ensures that first and second derivatives are right-signed.

<sup>4</sup> GNI is the sum of gross domestic product (GDP),  $rb_t$  and  $t_r$ .

<sup>5</sup> For the purpose of this paper  $r$  is exogenously given.

consumption tilting dynamics that may arise if there is a divergence between world interest rates and the domestic rate of time preference ( $\beta \neq 1/(1+r)$ ). For  $\Theta = 1$ , the consumption tilting component is zero, which implies that  $\beta=1/(1+r)$ . For  $\Theta > 1$ , the country is tilting consumption towards the future [ $\beta > 1/(1+r)$ ], while for  $\Theta < 1$ , the country is tilting consumption towards the present, that is, it is consuming more than its permanent cash flow.

There is no reason to presume that the consumption tilting parameter will be unity, so it is necessary to “detrend” the current account by first removing the consumption tilting component. Consumption tilting has implications for the current account that are different from consumption smoothing, so it is important to ensure that the optimal current account in (7) is only compared to that component of the current account that relates to consumption-smoothing, and not to the actual current account, which potentially includes both consumption smoothing and consumption tilting components. Moreover, the consumption-smoothing component is stationary, which has a number of econometric advantages that can be exploited.

Using the consumer’s budget constraint and incorporating (6), the consumption smoothing component of the current account is given by:

$$ca_t^* = -E_t \left( \sum_{j=0}^{\infty} (1+r)^{-j} \Delta z_{t+j} \right), \quad (8)$$

The current account will be in deficit when future changes in national cash flows are expected to be positive (reflecting temporary adverse shocks to cash flows), so that future output is transferred to the present (by external borrowing) to smooth the path of consumption. In contrast, permanent shocks, which by implication have no effect on expected changes in the cash flow variable, will have no impact on the current account.

Identifying the optimal consumption-smoothing component of the current account requires that (8) be estimated. This is challenging because it entails forecasting all the

variables into infinity. Campbell and Shiller (1987) have, however, shown that the current account reflects all the information available to agents for the purpose of forecasting these variables. Therefore, by including the current account in the conditioning information set, it is possible to capture agents' expectations of shocks to output, investment and government expenditure.

Following Campbell & Shiller (1987) and Ghosh & Ostry (1995), this, operationally, requires the estimation of an unrestricted VAR of the form:

$$\begin{bmatrix} \Delta z_t \\ ca_t^{sm} \end{bmatrix} = \begin{bmatrix} \Psi_{11} & \Psi_{12} \\ \Psi_{21} & \Psi_{22} \end{bmatrix} \begin{bmatrix} \Delta z_{t-1} \\ ca_{t-1}^{sm} \end{bmatrix} + \varepsilon_t \quad (9)$$

where  $ca_t^{sm}$  is the detrended or consumption smoothing current account balance. The VAR can be more compactly written as:

$$x_t = \psi x_{t-1} + \varepsilon_t$$

where the k-step ahead expectation of  $x_t$  is  $Et(x_{t+k}) = \psi^k x_t$ . The optimal consumption smoothing current account defined by (8) can therefore be expressed as follows:

$$\begin{aligned} ca_t^* &= - \sum_{j=1}^{\infty} \frac{1}{(1+r)^j} [1 \ 0] \psi^j x_t \\ &= - \frac{[1 \ 0] \psi}{(1+r)} \sum_{j=0}^{\infty} \frac{1}{(1+r)^j} \psi^j x_t \\ &= - \frac{[1 \ 0] \psi}{(1+r)} \left[ \frac{(I - \psi)}{(1+r)} \right]^{-1} x_t \equiv \Gamma x_t \quad (10) \end{aligned}$$

To evaluate (10) it is necessary to generate  $ca_t^{sm}$  and, by implication, the consumption tilting parameter ( $\Theta$ ). From (7),  $ca_t^{sm}$  is the residuals of the cointegrating relationship between private consumption ( $c_t$ ) and the national cash flow ( $z_t$ ). Callen & Cashin (1999) and Adediji (2000) used the Phillips and Hansen (1990) Fully Modified (FM) method, which yields asymptotically correct variance-covariance estimators when estimating

cointegrating vectors in the presence of serial correlation and endogeneity. However, as acknowledged by Phillips and Hansen (1990), the asymptotic properties of this parametric method is not very different from Full Information Maximum Likelihood (FIML) estimates. Accordingly, this paper employs a two variable Vector Error Correction Model (VECM) to evaluate  $ca_t^{sm}$ .

Once the optimal current account series ( $ca_t^*$ ) has been calculated, a number of tests can be performed. Most importantly, for (9) to be a valid framework, the behaviour of economic agents must be such that changes in the current account forecasts future changes in the national cash flow<sup>6</sup>. This hypothesis can be tested by using the standard t-statistic on  $\psi_{12}$  from expression (9). If this parameter is negative and significant, then the current account granger-causes national cash flow and the predicted optimal current account is valid.

The formal test of unsustainability for the entire sample period is based on whether or not the predicted (optimal) series is equal to the actual series. The optimal current account

balance is given by  $-\frac{[1 \ 0]\psi}{(1+r)}\left[\frac{(I-\psi)}{(1+r)}\right]^{-1}x_t$ , while the actual current account balance is

given by  $[0 \ 1]x_t$ . The two will be equal if and only if  $-\frac{[1 \ 0]\psi}{(1+r)}\left[\frac{(I-\psi)}{(1+r)}\right]^{-1}=[0 \ 1]$ ,

which implies that  $\psi_{11} = \psi_{21}$  and  $\psi_{22} - \psi_{12} = (1+r)$ .

We also propose here to classify the extent of the period-by-period deviation in the current account balance from the predicted by the following lower tailed criteria:

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<sup>6</sup> Along the optimal path, expected temporary positive shocks to the national cash flow will imply a fall in the current account balance and vice versa.

**Table 1**

<b>Threshold</b>	<b>Extent of Imbalance</b>
$D \leq \mu - 4\sigma$	Large Imbalance
$D \leq \mu - 5\sigma$	Chronic Imbalance

D is the deviation of the actual current account from the predicted optimal balance,  $\mu$  is the mean deviation over the sample (or a sub-period) and  $\sigma$  is the standard deviation.

The third issue relates to whether or not the current account breached the solvency condition over the period in question. The consumption smoothing model has as a maintained hypothesis that countries remain intertemporally solvent. Hakkio and Rush (1991) highlighted that a necessary and sufficient condition for the satisfaction of the consumer's intertemporal budget constraint is that there be a cointegrating relationship between  $z_t$  and  $c_t$ . If these two variables are cointegrated in the long run, then consumption cannot deviate too far from movements in the available resources of the economy (as captured in  $z_t$ ).

#### **4.2 Data and Results**

The GDP data by categories of expenditure were collected from several issues of the National Income and Product, to ensure that the most recent revisions were captured in the data series. To create GNI, net interest income and net transfers from the balance of payments estimates were used. All the series run from 1961 to 2002. Estimates of the expenditure components for 2002 were provided by the Bank of Jamaica (BOJ). The augmented Dickey Fuller test for unit root indicates that  $z_t$  and  $c_t$  are I(1) at the 1% level, while the detrended current account is I(0) (see table 2, appendix).

In relation to estimates of the consumption tilting parameter in the VECM framework, we employed the Akaike (AIC) and Schwarz Information Criteria (SIC) to test for the optimal lag length. While the SIC indicated two lags, compared with three lags as

suggested by the AIC, we opted to estimate the model with three lags<sup>7</sup> (see table 3, appendix).

Both the Johansen trace and the maximum eigenvalue statistics indicated the presence of a cointegrating relationship between  $z_t$  and  $c_t$ , but the form of the VECM was ambiguous. A cointegrating vector existed for the model with no trend or intercept in the long run equation, as well as the model with an intercept in the long run equation. The SIC, however, suggested that the former model was to be preferred (see table 4, appendix). The estimated error correction model (in logs) confirmed the presence of a cointegrating vector, as the error correction term was significant. This implies that Jamaica did not breach the intertemporal solvency condition over the period. Data permitting, an interesting question would be to identify if the solvency condition was breached towards the latter part of the sample.

The long-run coefficient relating  $z_t$  to  $c_t$  indicates that the consumption tilting parameter for Jamaica is 1.05 with a log run standard error of 0.02 (see table 5, appendix). This estimate is larger than those obtained by Ghosh and Ostry (1995) for most developing countries. In addition, Adedeji (2001) found that the consumption tilting parameter for Nigeria lies in the range 0.87 and 0.95. This result for Jamaica is not consistent with our *a priori* expectation in that the proximity of Jamaica to the USA should, through demonstration effects, induce a desire to bring forward future consumption by borrowing. A low savings rate in Jamaica should also be the natural outcome of the country's relatively high inflation experience over the sample period<sup>8</sup>. The estimated consumption tilting parameter for Jamaica implies, from either (6) or (7), that the consumption smoothing portion of the current account will be higher (perhaps positive) than the actual current account<sup>9</sup>.

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<sup>7</sup> The model with two lags had full rank.

<sup>8</sup> Ghosh and Ostry (1995) note that, if the theoretical model is taken literally,  $\Theta$  would be constant over the entire sample. This would have the troubling implication that, in infinity, Jamaicans would ultimately own the world. He suggests that this approach is to be viewed practically as an abstraction with empirical appeal of removing the trend from the current account, the result of, *inter-alia*, demographic shifts.

<sup>9</sup> From expression (6),  $\Theta > 0$  means that the optimal path of consumption will be lower than actual, while from expression (7), it means that the optimal current account will higher than actual.

Table 5 in the appendix presents the parameters of the fitted VAR defining the optimal current account. The model is valid because  $\psi_{12}$  is appropriately signed and significant, indicating that the current account granger-causes the national cash flow<sup>10</sup>.

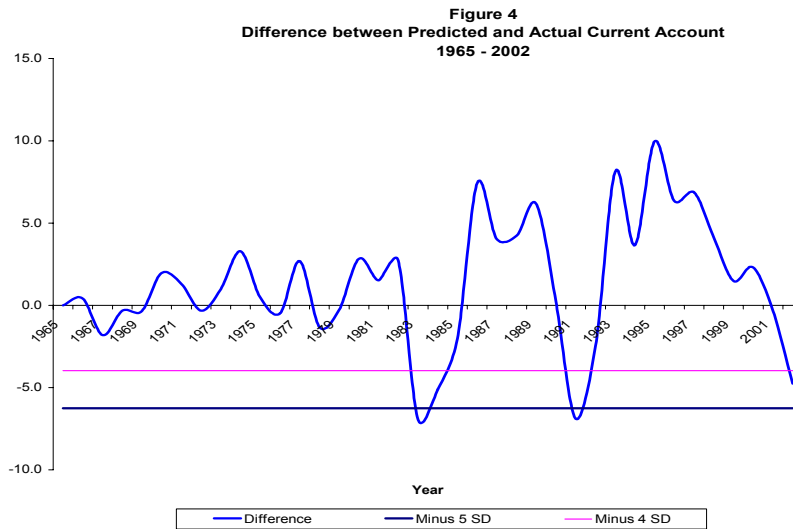
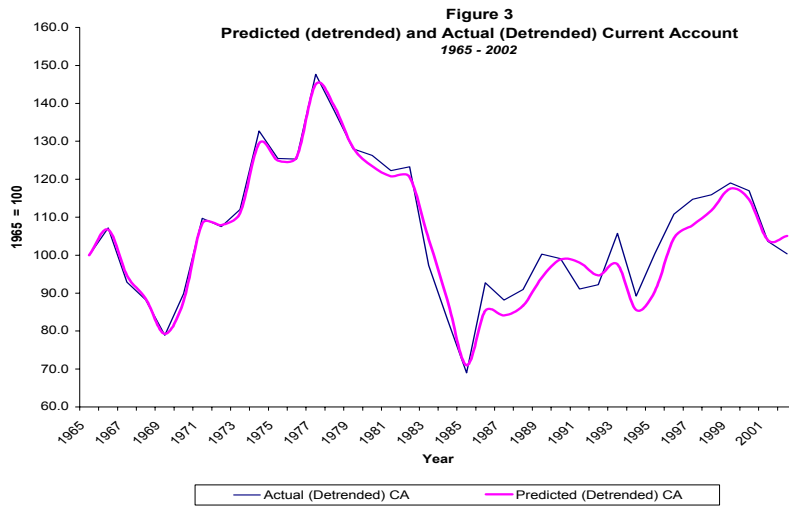
Figure 3 plots the actual current account and the predicted current account over the period 1965-2002<sup>11</sup>. The overall correlation between the two series is 0.98, which is relatively strong compared with the results produced by Adedeji (2001) for Nigeria. The graph also reveals that the current account deficit more closely conformed to the optimal balance between 1965 and 1982, compared with the period 1983 to 2002. For the first period, the average deviation was -0.9, compared with an average deviation of -3.2 in the second period. The volatility in the deviations was also less in the earlier period, reflecting a standard deviation of " 1.5, compared with " 5.2 for the later period. The closer correspondence between the actual and optimal current account balances over the earlier period may be explained by relatively more restricted access by Jamaicans to international financing. This restriction may have been the result of capital controls, IMF/World Bank agreements which restricted the states access to certain modes of external financing, or the general unwillingness of the international capital markets to hold the debt of small countries such as Jamaica, all of which would have prevented consumption expenditure from straying too far from the national cash flow.

Based on figure 4, the most severe imbalances, defined by those exceeding 4 standard deviations, occurred in 1983, 1991 and 2002, all of which fell into the latter period of analysis, while the largest positive deviations occurred in 1986, 1989, 1993 and 1995. The significant negative deviations in the current account, relative to the inter-temporal benchmark can be largely explained by terms of trade shocks and other structural changes in the economy.

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<sup>10</sup>  $\psi_{12}$  is -4.8 with an associated t-statistic which is greater than 2.0.

<sup>11</sup> Both series were set to 100 in the base year (1965).



The deviation in 1983 reflected the impact of the oil price shocks of 1979, which served to worsen the country's import bill with a lag, as well as general substitution of tradable for non-tradable commodities over the period. This deviation also reflected significant

deterioration in the fiscal position between 1976 and 1983. The current account for that year amounted to 15.3 per cent of GDP, the highest over the sample period.

The large deviation in 1991 coincided with the opening of the capital account and the subsequent redefinition of the rules of foreign exchange trading. Prior to this, the actual current account deteriorated in the context of an appreciating real exchange rate and an explicit foreign exchange guarantee to market participants in the auction system, leading to a significant build-up in arrears. The predicted deterioration in the current account was significantly smaller because Jamaicans were probably not optimistic about future growth in income.

The deviation in 2002 started with progressively larger deviations from as early as 1996. This was consistent with the trend deterioration in the fiscal accounts over that period. Moreover, the model could not have anticipated the various shocks to the economy.

Finally, the test of long run sustainability suggests that the predicted and actual current accounts do not converge as  $\psi_{11} - \psi_{21} = 5.12$ , which is significantly different from zero, while  $\psi_{22} - \psi_{12} = 0.49 \neq 1.04$ . The average deviation over the sample was 1.3, which indicates that the actual current was, on average, slightly above the optimal over the four decades. An interesting exercise, which data does not permit, would be to evaluate the issue of sustainability over the latter part of the sample period.

The inter-temporal benchmark model can also be used to evaluate the future path of the current account as done in Deutsche Bank (2000). This would require, as suggested by equation (9), multi-year forecasts of GDP, investment and government expenditure, in addition to selected components of the balance of payments. GDP growth projections and government spending are typically taken as exogenous. Investment is usually projected on the basis of an ICOR rule. This framework is not currently well developed for Jamaica, although Robinson (1986) attempted to generate GDP forecasts from a macroeconomic model. More recently, there has been renewed attempts at generating

multi-year forecasts in the context of the World Bank's Revised Minimum Standard Model – Extended (RMSM-X) and Small Scale Macro-models (SSMs) (see Allen, Hall, Robinson, (2002)).

As an alternative, we use the traditional accounting and present value approaches to evaluate the future path of the Jamaican current account. These approaches rely almost exclusively on medium term forecasts of the balance of payments.

## 5.0 Forward Looking Measures

### 5.1 *The Accounting Approach*

The accounting approach focuses on a particular debt ratio, typically debt to GDP. In this framework, a current account deficit is defined as sustainable if it does not generate increases in the debt/GDP ratio. It is useful to highlight that the evolution of the external indebtedness of the domestic economy is related to the size of the trade balance, as well as the interest rate on the economy's net liabilities. The external financing constraint can therefore be written as follows<sup>12</sup>:

$$B_t = (1 + i_t) B_{t-1} - (X - M)_t \quad (11)$$

Given the time paths for  $i_t$  and  $(X-M)_t$ , (11) describes the time path of the net external liabilities. This expression suggests that if the trade balance is zero [ $(X - M)_t = 0$ ], the economy's net external indebtedness will grow at a rate equal to  $i_t$ . On the other hand, if the economy runs a trade deficit, the debt stock will grow at a rate that exceeds world interest rates.

To derive the sustainability condition, we can rewrite (11) by dividing through by  $Y_t$  and making use of the fact that  $Y_t / Y_{t-1} = (1 + g_t)$ , where  $g_t$  is the growth rate of GDP:

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<sup>12</sup> Notice that this equation excludes transfers, an issue to which we will return.

$$\frac{B_t}{Y_t} = (1 + i_t) \frac{B_{t-1}}{Y_t} - \frac{(X - M)_t}{Y_t} = \frac{(1 + i_t) B_{t-1}}{(1 + g_t) Y_{t-1}} - \frac{(X - M)_t}{Y_t}$$

Denoting the ratios to GDP by lower case letters:

$$b_t = \left( \frac{1 + i_t}{1 + g_t} \right) b_{t-1} - (x - m)_t$$

Subtracting  $b_{t-1}$  from both sides, the change in the debt /GDP ratio is:

$$\begin{aligned} \Delta b_t &= b_t - b_{t-1} = \left( \frac{1 + i_t}{1 + g_t} \right) b_{t-1} - \left( \frac{1 + g_t}{1 + g_t} \right) b_{t-1} - (x - m)_t \\ &= \left( \frac{i_t - g_t}{1 + g_t} \right) b_{t-1} - (x - m)_t . \end{aligned}$$

The condition for sustainability therefore is:

$$\left( \frac{i_t - g_t}{1 + g_t} \right) b_{t-1} - (x - m)_t = 0 \tag{12}$$

If the trade balance is zero, the change in the debt to GDP ratio will depend on the difference between the interest rate on the economies net external liabilities and the growth rate of GDP. If the domestic growth rate is less than the interest rate on external liabilities, the debt to GDP ratio will increase. To maintain a particular debt to GDP ratio, the trade **surplus** must be sufficient to offset the growth in the debt stock as a result of the interest rate/GDP growth rate differential. Negative values of (12) imply that the debt stock will increase.

The accounting approach can also be used to assess consistency among various macroeconomic policy targets. For example, targets can be set for the debt to GDP ratio, GDP growth rate and/or a projected interest rate path, and then evaluated in the context of this approach. Its main shortcoming, however, is that it assumes that liabilities can

continue to grow at the interest rate/GDP growth rate differential. This ignores the role that lenders/investors ultimately play in determining the evolution of an economy's liabilities.

## 5.2 *The Present Value Constraint Approach*

Cashin and McDermott (1998) highlights that, in evaluating the sustainability of an economy's external imbalance, an important question is whether the country in question is solvent. Solvency holds if the present value (PV) of future trade surpluses is equal to current external indebtedness. That is, the country is able to meet its intertemporal budget constraint under the current policy stance.

The PV approach looks at the country's financing constraint in level terms and not as ratios to GDP, as in the accounting approach. As such (11) can be rewritten as follows:

$$B_{t-1} = \frac{B_t}{1 + r_t} + \frac{(X - M)_t}{1 + r_t},$$

where all the variables are the same as in (11), but expressed in real terms in the unit of the domestic currency. Under the assumption of constant real interest rates on the economy's net external liabilities, the above expression can be iterated forward N periods to get

$$B_{t-1} = \sum_{j=0}^N \frac{(X - M)_{t+j}}{(1 + r)^{j+1}} + \frac{B_{t+N}}{(1 + r)^{t+N}}.$$

The "no ponzi game" (NPG) condition,  $\lim_{N \rightarrow \infty} \frac{B_{t+N}}{(1 + r)^{t+N}} = 0$ , states that, in the limit,

the present value of the expected future stream of debt (the debt stock) converges to zero, which implies that real debt (B) must grow at a slower rate than the growth rate of the discounting term (the real interest rate). The NPG condition implies that lenders will not

allow debtor nations to repay their debt by continuously borrowing the money needed for debt servicing<sup>13</sup>.

Given the NPG condition, a nation's debt at any point in time must therefore be equal to the present value of the expected future trade surpluses:

$$B_{t-1} = \sum_{j=0}^n \frac{(X - M)_{t+j}}{(1 + r)^{j+1}} \quad (13)$$

Milesi-Ferretti and Razin (1996) are strongly critical of sustainability analyses that focus exclusively on solvency conditions. They note that such an analysis is complex as imbalances in the current account reflect the decisions of government, domestic agents and foreigners. The decisions of government may be predictable but the savings and investment decisions of private agents may not be. They also note that the analysis of solvency only considers the ability of the debtor nation to pay, not their willingness. As such, although the present discounted value of trade surpluses may theoretically be sufficient to repay the country's external debt, diverting output from the domestic economy to external use in order to service the debt may not be politically feasible.

### 5.3 *Data & Results*

The most challenging issue in implementing (12) and (13) was the estimation of the IIP for Jamaica. The United Nations Commission on Trade and Development (UNCTAD) prepares and disseminates crude estimates for Jamaican foreign direct investments (FDI) assets and liabilities by adding gross flows in the capital and financial account to the assets/liabilities of the previous period<sup>14</sup>. These estimates are inadequate because they do not cover the entire range of capital flows to Jamaica. Specifically, they ignore assets and

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<sup>13</sup> In a Ponzi scheme the borrower, owing a debt (B), must pay (1 + r) B when the debt comes due. If the borrower takes a new loan equal to (1 + r) B in order to pay the old lender, the borrower will have to pay (1 + r) 2 B the next time around. The debt will therefore grow at the geometric rate of (1 + r) and, with this scheme, the discounted debt would not converge to zero.

<sup>14</sup> It is not clear how the assets and liabilities for the base period are derived.

liabilities relating to portfolio and other investment flows<sup>15</sup>. In addition, the UNCTAD method does not, apparently, provide for depreciation expenditure.

In this context we propose preliminary estimates<sup>16</sup> of the international assets and liabilities of the private sector as follows:

$$K_t = K_{t-1}(1 - 1/j) + \Delta K \quad (14)$$

where  $K_t$  is the stock of private sector liabilities/assets in period  $t$ ,  $\Delta K$  is gross investment inflows/outflows while “ $j$ ” is the depreciation period. The expression  $K_{t-1}(1 - 1/j)$  is the stock of assets/liabilities adjusted for depreciation. For FDIs, we assume that  $j=5$  for the liabilities, while for the assets,  $j=15$ <sup>17</sup>. In computing the initial stock ( $K_0$ ), recall that investment income flows ( $int$ ) are related to the asset/liabilities of some previous period through institutionally determined rates of return (ROR)/interest rates ( $r$ ) in that period ( $int_t = r_{t-1} K_{t-1}$ ), which implies that  $K_0 = \frac{int_1}{r_0}$ <sup>18</sup>.

For the purpose of this paper  $K_t$  is decomposed into fixed (FDI), portfolio and “other” assets/liabilities. FDI is further decomposed into mining, freezone and other<sup>19</sup>. For the stock of FDI liabilities ( $K_0$ ) in the base year (FY1999/00), we assume an average ROR on investment of 15.0 per cent for all the classes of foreign direct investment<sup>20</sup>, but we adopt the UNCTAD estimates for the stock of assets. In relation to portfolio and other investment stocks, the base year estimates of assets and liabilities are conditioned on

<sup>15</sup> The latter flows include trade credits, changes in commercial bank’s assets and liabilities and other private sector loans. The largest component of this is commercial bank’s assets and liabilities.

<sup>16</sup> The BOJ is currently in the process of formally estimating IIPs.

<sup>17</sup> This assumption incorporates the view that foreigners typically invest in Jamaica by purchasing machinery and equipment, which will depreciate over a 5-year period. In the case of Jamaicans investing abroad, much of this is in hotels and other properties, which have a longer depreciation cycle, say 15 years.

<sup>18</sup> The interest rates for subsequent periods are implicit, that is, the ratio of interest payments to external liabilities.

<sup>19</sup> This “other” largely relates to the investment activities of a wide range of firms including banks and other financial companies, food retailers, and other service providers.

<sup>20</sup> The mining industry reported rates of return on investment between 15.0 per cent and 18.0 per cent between 1990 and 2002. In the absence of information on the other areas of investment, we assumed the 15 per cent ROR for all classes of FDI.

domestic interest rates (treasury bills) and external rates (proxied by US treasury bonds and LIBOR), respectively.  $\Delta K$  and  $int_t$  are taken directly from the annual estimates prepared by the BOJ. The external assets and liabilities of the public sector are readily available.

Table 7 in the appendix presents crude estimates and forecasts of the Jamaican private sector's IIPs. The estimates suggest that the overall IIP for FY1999/00 was negative US\$1.7 billion, which fell to negative US\$2.3 billion by the end of FY2002/03. The principal component of these positions was foreign direct investments, which was negative US\$1.5 billion in FY1999/00 and remained fairly stable up to FY2002/03. The Bank's projections suggest, in the context of a consistent fall in IIP relating to other investments, that the overall private sector IIP will approximate negative US\$3.5 billion by the end of FY2007/08.

The IIP for the public sector (including the reserve assets of the central bank) was negative US\$2.4 billion in FY1999/00 and remained fairly stable up until FY2002/03. Assuming that external creditors are willing to lend to the Jamaican Government, and that the Government borrows abroad to cover external debt servicing, the IIP for the overall public sector is projected to grow to approximately negative US\$3.7 billion by the end of FY2007/08 (see table 8).

The overall IIP (public and private) amounted to approximately 60.0 per cent of GDP at the end of FY2002/03 and is projected to grow to approximately 77.0 per cent of GDP in FY2007/08. The private sector position represents, on average, one half of the net external indebtedness of the economy.

The results for the accounting and present value approaches are presented in table 9 in the appendix. For the period 1999/00 to 2002/03, the first current account sustainability measure (CASM1 as defined by expression 12) was negative. It increased from -0.15 in FY1999/00 to -0.26 in FY2001/02. CASM1 remains negative over the forecast horizon, albeit with a declining trend. CASM1A, which takes unrequited transfers into account, is

significantly smaller than CASM1, underpinning the contribution of remittances to the Jamaican economy. Notwithstanding, this measure of sustainability was increasingly negative over the historical period, and is projected to remain negative over the medium term. As with CASM1, however, the tendency is for a trend improvement in CASM1A. The sign and trend in these measures of sustainability confirms that the net external debt of the country is likely to continue growing over the medium term and the current account deficit is therefore unsustainable.

Two simple scenarios suggest the magnitude of the adjustment required by the Jamaican economy to, at minimum, maintain the debt stock realized in FY2002/03 over the period FY2003/04 to FY2007/08. Crudely assuming no change in the interest rate profile facing the country and assuming that buoyancy in the economy is entirely driven by domestic absorption, GDP growth would have to average approximately 16.0 per cent over the medium term to restore the sustainability condition. Similarly, a significant adjustment to an average of 37.0 per cent of GDP in the goods and services balances, from the current passively projected average deficit of 3.5 per cent of GDP, would be necessary to maintain the debt stock at its end FY2002/03 level.

Consistent with the results for CASM1, CASM2 and CASM2A from (13) are both positive, suggesting that the projected net earnings of the economy over the long run will likely be insufficient to offset the current level of indebtedness of the economy.

## **6.0 The Sustainability of Current Transfers**

Milesi and Razin (1996) suggested a nonstructural framework, involving selected indicators, for assessing current account sustainability. These indicators are directly related to the ability of a country to generate future surpluses so as to repay external liabilities. They typically seek to gauge whether private sector and/or government behaviour are inconsistent with their intertemporal budget constraints. Some indicators seek to measure the vulnerability of the country to external shocks. More generally, indicators such as economic growth, the rate of investment, export performance and

outlook, the performance and outlook of selected items of the BOP and openness to trade are usually monitored with a view to identifying behavioural changes that may affect the sustainability of the current account.

Migrant remittances have emerged as one of the fastest growing component of foreign exchange earnings for Jamaica over the last three years. Gross remittance inflows grew by an average of 18.0 per cent between 2000 and 2002. Accordingly, transfers now represent one of the most important sources of foreign exchange for the Jamaican economy, accounting for more than 27.0 per cent of total inflows. Earnings from remittances have become more important, relative to mining, tourism and foreign direct investment (see table 10, appendix). Moreover, anecdotal evidence suggests that the foreign exchange retention from transfers is larger than those for the more traditional sectors.

These facts suggest that an analysis of the sustainability of migrant transfers to Jamaica is essential in evaluating the sustainability of the overall current account. Dixon (1997) evaluated the sustainability of transfers as a key component of the Jamaican BOP. We also analyse this issue, given the importance of remittance inflows to the Jamaican economy, the current account, and to the sustainability measures outlined in the previous sections. In addition, it is to be noted that little attention has been paid in the literature to the size, scope and sustainability of transfers. The main focus will be on evaluating the sustainability of migrant transfers as it relates to selected factors that affect migration.

The growth in remittances in Jamaica mirrors the trend in the Latin America and the Caribbean (LAC) region. In 1990, remittances to the LAC region were approximately US\$4.8 billion<sup>21</sup>. By 2002, this flow reached an estimated US\$32.0 billion<sup>22</sup>. The LAC region is now the largest recipient of remittance inflows in the world, with nearly 78.0 per cent coming from the USA. Mexico is the largest recipient of remittances in the region, with inflows amounting to approximately US\$9.3 billion in 2001. However,

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<sup>21</sup> IMF Balance of Payments Annual Yearbook, 1999

<sup>22</sup> The Inter-American Development Bank notes that remittances to LAC region in 2002 rose by 17.6 per cent, relative to 2001.

relative to GDP, remittances are most important for Nicaragua and Haiti (see table 11, appendix).

One of the reasons for the acceleration in remittances to the LAC region, including Jamaica, was increased migration. Migration from Jamaica has been significant from as far back as the early 1900s with the building of the Panama Canal (1914), to the migration of Jamaicans to serve in World War II (1939-1945). Again in the 1950s to the late 1960s, Jamaicans migrated to the United Kingdom (UK) to assist with rebuilding the infrastructure of that economy. Since the start of the 1980s, migration patterns have shifted in favour of North America, in particular the USA. Table 10 in the appendix indicates that, during the decade of the 1990s, over 80.0 per cent of migrating Jamaicans went to the USA, followed by Canada (18.3 per cent) and the UK (1.5 per cent). Migration from Jamaica to the USA, Canada and the UK during the 1970s averaged 14,000 persons per year, but accelerated to approximately 20,000 in the 1980s. There was a moderation in migration in the 1990s to an annual average of approximately 16,500 persons, partly attributed to legislative reforms in the USA<sup>23</sup>.

Jamaican migrants are primarily employed in the services sector in the USA, and they are heavily concentrated in the states of New York and Florida<sup>24</sup>. The Statistical Yearbook of Immigration and Naturalization Service indicates that, between 1996-2001, the majority of Jamaican migrants (an average of 61.4 per cent) did not report an occupational category. However, the second highest occupational category reported was the services sector (with an average of 16.7 per cent). This sector included functions such as agricultural services, transportation, hotel and lodging, business, education, legal, health, personal, educational, and private household services, among others.

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<sup>23</sup> These reforms included the Immigration Act of 1990, an amendment to the Immigration and Nationality Act in 1995, the Personal Responsibility and Work Opportunity Act (1996), the Illegal Immigration Reform and Immigration Responsibility Act (1996). More recently, the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT ACT) Act of 2001 was passed.

<sup>24</sup> An average of 39.2 per cent of Jamaican migrants resided in New York, with Florida accounting for an average of 32.7 per cent.

Orozco (2002) and Dixon (1997) pointed to several factors that may be used to assess the future of migration from and, consequently, remittance flows to Jamaica. These factors can be classified as “push” and “pull” factors. Push factors include the incidences of poverty and crime<sup>25</sup>, the level and changes in per capita income, and changes in unemployment. Higher levels of crime, poverty and unemployment would precipitate an increase in migration, while an increase in per capita income and/or real economic activity in Jamaica would moderate the incentives for migration. Pull factors include the level and change in income and employment of people in the destination country. Commitment to family and access to remittance services are also important factors affecting the stream of remittances from these migrants.

On the basis of the correlations in table 2, the push factors appear to dominate the pull factors. In particular, the incidence of poverty in Jamaica, GDP and per capita GDP are highly correlated with migration. The incidence of crime is also a relatively important push factor. The correlation coefficients relating to the pull factors do not have the right signs, and this may suggest that Jamaicans migrate more on the basis of perception than on the basis of actual economic conditions in the USA.

Table 2

<b>Factors Affecting Migration from Jamaica 1990-2001</b>	
<b>Push factors</b>	<b>Correlation</b>
Jamaica	
Incidence of Crime	0.60
Incidence of poverty	0.76
No. of persons unemployed	-0.22
Per capita Income	-0.69
GDP	-0.84
<b>Pull Factors</b>	
USA	
Growth in Services Sector	-0.84
Per capita Income	-0.83
GDP	-0.84
No. of persons unemployed	0.72

<sup>25</sup> Reported cases of offenses against person, property and fraud.

Significant improvements in transportation, communication and information technology have also made it easier for migrants to send back money. The greater the number of intermediaries, the greater the likelihood that remittances will increase. For Jamaica, the total number of outlets facilitating electronic money transfer has increased from 230 in 1997 to 349 in 2001. These intermediaries have also extended their network overseas close to, or within communities with a high percentage of Jamaican migrant workers. This increase in numbers has also engendered increased competition and the intensification of promotional efforts both locally and abroad, with companies upgrading their money transfer technology, improving speed and service to customers. In this context, improved data capture could also help to explain the rapid growth in remittances between 1999 and 2002.

The proliferation of remittance companies may also precipitate a gradual decline in the transfer costs. For Jamaica and the rest of the LAC region, the cost for remitting has remained relatively high, compared with similar transactions in industrialised countries. It has been noted that these costs are high because banks are less involved in these transactions than they are in other regions of the world. Several multilateral entities have, however, sought to leverage these funds as a development tool and to promote lower average costs of transactions. The aim is to increase the financial resources of those who receive remittances in the LAC region, thereby contributing to the sustainability of these flows and to improve the developmental impact of these funds.

Finally, given the aging population in the USA, the need for workers in the care-giving sub-sector of the health services sub-sector will continue to be a pull factor for many Jamaicans. The US Census Bureau noted that US citizens born during the early years of the “baby boom” (1946 through 1950) fuelled a 55.0 per cent increase of the 50-year to 54-year cohort during the 2000 US census, the largest percentage growth between 1990 and 2000 of any five-year age group. The second fastest-growing group was 45- to 49-year-olds, which registered a 45-percent increase.

The strength of the link between Jamaican migrants and Jamaica appears to be getting weaker, however, suggesting a risk to the long run viability of transfers. The largest age group of Jamaican migrants over the period 1996-1999 was the 10-14 year category and remained so in 2000 and 2001. The Jamaicans who were naturalized in the USA during the period 1996 to 2001 fell primarily in the 35-44 years category. This indicates that entire families are migrating, or that existing migrants were being reunited with their families.

The overriding conclusion, therefore, is that Jamaica will continue to benefit from migrant transfers. Given the relative importance of the push factors for migration, migration from Jamaica is likely to continue for the foreseeable future. The changing pattern of migration as well as the fact that the recent acceleration in growth rate was, in part, related to improved data capture, suggest that the growth in remittances could however taper off. This is compounded by the risk of further adverse changes in immigration laws in the major industrialised countries.

## **7.0 Conclusion**

This paper has assessed the sustainability of the current account by applying traditional models of inter-temporal solvency to Jamaican data. It also attempted to quantify, in a preliminary way, the size and evolution of the country's net external liabilities, as a precursor to evaluating the future path of these liabilities. The analysis suggests that over Jamaica's recent history, the current account has not breached the solvency condition, but there were clearly defined periods when the imbalance was severe, and if continued would have implied that the deficit was unsustainable.

Beyond 2002, there is little indication that the country's net external liabilities will stabilise. Relatively large current account deficits are expected over the medium term, driven by continued imbalances in the goods and services sub-account, as well as higher net interest and profit payments. In the context of a large and growing external debt burden, this outlook implies that international investors will become increasingly

unwilling to expose themselves to the risks that Jamaica entails. There is likely to be increased reticence on the part of the international capital markets to lend to the Government, coupled with increased propensities on the part of investors to take their profits out of the country. The country could therefore face a significant external financing crisis.

This assessment points to the need for fairly dramatic and immediate adjustments in macroeconomic and structural policies. Fiscal policy adjustments are clearly mandatory, but there is a need for initiatives aimed at stimulating relatively large growth in the real sector, targeted principally at tradable goods and services. These initiatives could be modelled, in terms of financing and private sector participation, on large infrastructural projects underway in the Island, but with a greater emphasis on export led growth. To the extent that growth in remittances can be encouraged and leveraged towards development, an initiative that is already underway in some multilateral financial institutions, this would also be good.

## 8.0 Appendices

Country Name	1972-1981	1982-1991	1992-2001	1972-2001
Argentina	-5.6	-4.2	-0.1	-3.3
Chile	-0.9	-0.4	-0.3	-0.5
China, P.R.: Mainland	n.a.	0.9	8.4	4.7
Egypt	-6.0	-1.5	0.4	-2.4
Hungary	n.a.	-0.1	-0.3	-0.2
India	-0.2	-5.5	-2.2	-2.6
Indonesia	0.0	0.0	0.0	0.0
Ireland	-8.3	-3.2	2.3	-3.0
Israel	-6.5	-2.0	-3.3	-3.9
<b>Jamaica</b>	<b>-8.1</b>	<b>-8.0</b>	<b>-3.3</b>	<b>-6.5</b>
Korea	-4.3	1.0	1.0	-0.8
Malaysia	-1.0	-2.8	1.0	-1.0
Peru	n.a.	n.a.	-5.6	-5.6
Philippines	-5.1	-3.7	0.5	-2.7
Poland	n.a.	-1.6	-3.9	-2.7
Singapore	-11.0	2.3	17.1	2.8
Trinidad and Tobago	6.3	-3.4	-0.7	0.8
Turkey	n.a.	0.1	-1.1	-0.5
Venezuela, Rep. Bol.	2.7	2.3	3.1	2.7
<b>Average</b>	<b>-3.1</b>	<b>-1.3</b>	<b>0.9</b>	<b>-1.0</b>

*Source: International Financial Statistics (IMF)*

**Table 2: ADF Unit Root Tests**

Variables	Levels			First Difference		
	Lagged Diff	$\rho$	Critical Value (1%)	Lagged Diff	$\rho$	Critical Value (1%)
$Z_t$	1	-1.21**	-4.23	0	-3.78*	-2.63
$c_t$	0	1.47*	-3.60	0	-4.27*	-3.61
$Ca_t^{*/1}$	0	-6.30***	-2.63	n/a	n/a	n/a

\* Intercept

\*\* Intercept and Trend

\*\*\* No Intercept or Trend

/1 residual from VECM

**Table 3: Lag Length Selection Criteria**

lags	4	3	2	1
Akaike Information Criteria	-4.37	-4.65	-4.58	-3.51
Schwarz Criteria	-3.60	-4.06	-4.16	-3.26

**Table 4: Model Selection Criteria**

<b>Model Structure</b>					
<i>Dynamic Component</i>					
Trend	None	None	Linear	Linear	Quadratic
<i>Long Run Component</i>					
Intercept	No Intercept	Intercept	Intercept	Intercept	Intercept
Trend	No Trend	No Trend	No Trend	Trend	Trend
<b>Number of Cointegrating Relations by Model (columns)</b>					
Trace Statistic	1	1	0	0	0
Max-Eig	1	1	0	0	0
<b>Log Likelihood by Rank (rows) and Model (columns)</b>					
0	100.1	100.1	106.3	106.3	106.3
1	107.7	108.4	111.2	112.6	112.6
2	108.7	111.3	111.3	115.3	115.3
<b>Akaike Information Criteria by Rank (rows) and Model (columns)</b>					
0	-4.64	-4.64	-4.86	-4.86	-4.75
1	-4.82	-4.81	-4.91	-4.93	-4.87
2	-4.67	-4.70	-4.70	-4.81	-4.81
<b>Schwarz Criteria by Rank (rows) and Model (columns)</b>					
0	-4.12	-4.12	-4.25	-4.25	-4.06
1	-4.13	-4.08	-4.13	-4.11	-4.01
2	-3.81	-3.75	-3.75	-3.77	-3.77

**Table 5**  
**Vector Error Correction Estimates**

Cointegrating Eq:	CointEq1	
LZT <sub>t-1</sub>	1	
LCT <sub>t-1</sub>	-1.05	
	-0.02	
	[-44.65]	
Error Correction:	$\Delta$ LZT	$\Delta$ LCT
CointEq1	-0.16	-0.14
	[-2.78]	[-2.77]
$\Delta$ LZT <sub>t-1</sub>	-0.29	-0.10
	[-0.75]	[-0.29]
$\Delta$ LZT <sub>t-2</sub>	0.21	0.19
	[0.53]	[0.54]
$\Delta$ LZT <sub>t-3</sub>	0.21	0.60
	[0.56]	[1.82]
$\Delta$ LCT <sub>t-1</sub>	0.46	0.39
	[1.06]	[1.04]
$\Delta$ LCT <sub>t-2</sub>	-0.50	-0.38
	[-1.12]	[-0.98]
$\Delta$ LCT <sub>t-3</sub>	-0.41	-0.85
	[-0.97]	[-2.34]
R-squared	0.16	0.30
Adj. R-squared	-0.02	0.15
Sum sq. resids	0.45	0.34
S.E. equation	0.13	0.11
F-statistic	0.89	1.95
Determinant Residual Covariance		0.0
Log Likelihood		86.9
Log Likelihood (d.f. adjusted)		79.0
Akaike Information Criteria		-3.7
Schwarz Criteria		-3.0

t-statistics in [ ]

**Table 6: Bivariate VAR  
Optimal Current account Balance**

	$\Delta Z_t$	$\Delta CA_t^{sm}$
$\Delta Z_{t-1}$	<b>0.29</b> (-0.16) (-1.81)	<b>0.00</b> (-0.01) (-0.28)
$\Delta CA_{t-1}^{sm}$	<b>-4.83</b> -1.99 (-2.42)	<b>0.78</b> -0.11 (-7.15)
C	600.97 -212.71 (-2.83)	22.73 -11.67 (-1.95)
R-squared	0.19	0.62
Adj. R-squared	0.14	0.60
Akaike AIC	13.59	7.78
Schwarz SC	13.72	7.91
Mean dependent	118.61	106.36
S.D. dependent	224.04	17.93

*Standard errors & t-statistics in parentheses*

**Table 7**

<b>Private Sector International Investment Position (IIP)</b>									
<b>1999/00 - 2007/08</b>									
Fiscal Year	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
US\$MN									
Overall IIP	-1671.5	-1912.8	-2270.3	-2264.1	-2436.2	-2660.2	-2987.5	-3388.1	-3752.1
IIP (FDI)	-1538.5	-1674.0	-1698.4	-1644.2	-1534.4	-1481.1	-1476.3	-1514.0	-1589.8
IIP (Portfolio)	13.5	53.8	26.4	6.2	-17.1	-43.5	-73.3	-106.7	-143.7
IIP (Other Investments)	-146.5	-292.7	-598.3	-626.2	-884.8	-1135.6	-1437.9	-1767.5	-2018.6
% GDP									
Overall IIP	-22.1	-25.0	-28.9	-28.7	-33.9	-35.1	-37.6	-40.4	-42.4
IIP (FDI)	-20.4	-21.9	-21.6	-20.8	-21.4	-19.6	-18.6	-18.1	-18.0
IIP (Portfolio)	0.2	0.7	0.3	0.1	-0.2	-0.6	-0.9	-1.3	-1.6
IIP (Other Investments)	-1.9	-3.8	-7.6	-7.9	-12.3	-15.0	-18.1	-21.1	-22.8

Table 8

Public Sector International Investment Position (IIP)									
1999/00 - 2007/08									
Fiscal Year	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	2004/05	2005/06	2006/07	2007/08
US\$MN									
Public Sector IIP	-2358.9	-2260.5	-2131.1	-2494.8	-2999.4	-3200.3	-3368.8	-3380.9	-3673.8
Gross external assets	805.9	1363.8	2004.2	1385.4	1018.7	1063.6	1109.2	1163.9	1086.3
Gross external liabilities	3164.8	3624.3	4135.3	3880.2	4018.2	4264.0	4478.0	4544.8	4760.1
% GDP									
Public Sector IIP	-31.2	-29.5	-27.1	-31.6	-41.8	-42.3	-42.4	-40.3	-41.5
Gross external assets	10.7	17.8	25.5	17.5	14.2	14.0	14.0	13.9	12.3
Gross external liabilities	41.9	47.3	52.6	49.1	55.9	56.3	56.3	54.2	53.8

Table 9

Indicators of Current Account Sustainability									
FY1999/00 - FY2007/08									
Fiscal Year	Actual				Forecast				
	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	2004/05	2005/06	2006/07	2007/08
<b>CASM1*</b>	-0.15	-0.18	-0.21	-0.26	-0.27	-0.24	-0.24	-0.23	-0.24
<b>CASM1A**</b>	-0.06	-0.07	-0.10	-0.13	-0.12	-0.09	-0.09	-0.09	-0.11
<b>CASM2</b>				0.232					
<b>CASM2A**</b>				0.237					
Goods & Services (% of GDP)	-8.4	-12.7	-15.8	-19.9	-20.7	-17.7	-17.1	-16.8	-17.1
Goods, Services & Transfers (% of GDP)	0.8	-1.9	-4.3	-7.4	-5.6	-2.9	-2.6	-2.6	-3.4
Interest Rate on Net External Liabilities (%)	10.8	10.8	11.5	12.3	12.2	11.5	11.5	11.6	12.3
GDP Growth Rate (%)	-0.6	1.2	1.3	1.5	2.0	3.0	3.0	3.0	3.0
<b>Sustainability Scenario</b>									
GDP Growth Rate (% Change)	-0.6	1.2	1.3	1.5	19.1	15.3	15.1	14.9	15.9
Goods and Services Balance (% of GDP)	-8.4	-12.7	-15.8	-19.9	20.1	37.8	38.7	40.0	40.4

\* CASM means "Current Account Sustainability Measure"

\*\* Includes Transfers

**Table 10**  
**Comparative source of foreign exchange inflows – Jamaica**  
**1990-2001**

Year	Remittances		Mining	Tourism	FDI Inflows
	% of GDP	% of Total Inflows			
1990	6.8	15.9	15.9	16.1	3.8
1991	7.6	15.6	16.8	19.6	4.4
1992	10.5	19.4	15.2	23.3	5.2
1993	9.0	20.6	11.4	20.5	3.0
1994	10.7	22.9	12.9	20.4	2.7
1995	10.6	23.7	12.5	19.0	2.6
1996	10.2	24.9	10.7	17.0	2.9
1997	9.1	24.3	10.0	15.6	2.8
1998	9.1	23.2	9.1	16.1	5.0
1999	9.4	22.1	9.1	17.1	7.0
2000	10.7	24.3	9.6	17.5	6.2
2001	12.5	27.3	9.5	15.9	7.9

Total Inflows = Mining + Tourism + FDI

Source: Bank of Jamaica

**Table 11**

<b>Remittances to Latin America &amp; the Caribbean (2001)</b>		
Country	Remittances (US\$m)	Remittances % of GDP
Mexico	9,273	1.72
Brazil	2,600	0.51
El Salvador	1,972	14.35
Dominican Republic	1,807	7.81
Ecuador	1,400	8.18
Jamaica	968	12.45
Cuba	930	5.03
Peru	905	1.68
Haiti	810	23.16
Colombia	670	0.81
Nicaragua	610	23.85
Guatemala	584	2.79
Honduras	460	7.18
Bolivia	103	1.29

Sources: Multilateral Investment Fund, IDB

IMF Statistics, April 2003, Central Banks of each country

**Table 12**  
**Trends in Jamaican Migration by Receiving Country**  
**1989-2001**

<b>Year</b>	<b>Canada</b>	<b>UK</b>	<b>USA</b>	<b>Total</b>
<b>1989</b>	3,952	322	19095	23,369
<b>1990</b>	4,959	394	18828	24,181
<b>1991</b>	5,057	418	18025	23,500
<b>1992</b>	5,993	328	18914	25,235
<b>1993</b>	6,075	288	16969	23,332
<b>1994</b>	3,912	334	14349	18,595
<b>1995</b>	3,619	242	16398	20,259
<b>1996</b>	3,283	262	19089	22,634
<b>1997</b>	2,847	260	17840	20,947
<b>1998</b>	2,251	325	15146	17,722
<b>1999</b>	2,354	307	14733	17,394
<b>2000</b>	2,473	363	16000	18,836
<b>2001</b>	2767	297	13609	16,673
<b>Total</b>	45,590	3,818	199,900	249,308
<b>Of Total</b>	18.3%	1.5%	80.2%	100%

*Source: The Statistical Yearbook of Immigration and Naturalisation Service, the Canadian High Commission, the Planning Institute of Jamaica*

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