April 2009

Revisiting Current Account Sustainability Measures for Jamaica:
An Assessment

Lance Rochester[1]

International Economics Department
Research and Economic Programming Division
Bank of Jamaica

Abstract

This paper assesses the sustainability of the Jamaican current account deficit over the period 1962-2008 and the medium-term using 7 approaches. Of these, 6 indicate that the Jamaican current account is not sustainable while 1 indicates weak sustainability. The results point to a marked deterioration in the current account towards the latter part of the sample, in particular, the period 2005-2008.

JEL Classification: F32, F35

Keywords: sustainability, current account.

[1] The views expressed in this paper do not necessarily reflect those of the Bank of Jamaica.

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1.0 INTRODUCTION

Several episodes of economic crises in emerging market economies were triggered by large and unsustainable current account deficits (CADs). The lack of access to international credit markets and the resulting global economic downturn that ensued during the subprime crisis in 2008 exposed the vulnerabilities of countries that were dependent on external financing, remittances and foreign investment to finance their CADs. In the latter half of 2008, for example, Iceland, Hungary, Armenia and Belarus, among others, approached the IMF for funding to stave off balance of payments crises which were induced by tightened world credit markets. Jamaica's CAD has deteriorated steadily since 1962 to 20.0 per cent of GDP in 2008. In the context of the global recession and credit crunch, Jamaica's need for external funding has generated renewed interest in the sustainability of the country's current account position.

There are several ways to examine and define a sustainable external balance, most of which focus on a country's intertemporal solvency. An economy is solvent if the present value of future trade balances is equivalent to the present value of its foreign debt. This suggests that countries with large CADs can be solvent if compensating positive trade balances are envisioned in the future (Mcgettigan, 2000). According to Milesi-Ferretti and Razin (1996), however, solvency assessments can be inadequate in evaluating the sustainability of current account balances because they overlook a country's willingness to pay debt and assume that foreigners are willing to lend to the country on current terms. The authors argue that sustainability assessments should evaluate whether a current account balance would result in a 'drastic' policy shift or a balance of payments crisis if the current government's policy stance and/or if the present private sector behaviour remains unchanged. Ostry (1997) extended this concept by also examining the risks associated with current account positions. Both external and internal shocks may affect the willingness or ability of investors to lend, resulting in once sustainable current account positions becoming unsustainable.

This paper groups the approaches to measuring current account sustainability into two categories. The first includes approaches which are concerned with the country's net

indebtedness. This category includes the accounting approach, portfolio approach, external sustainability approach, present value constraint approach and the cointegration approach. According to these approaches, a current account position is sustainable once it does not lead to an increase in the country's external liabilities or worsening of the International Investment Position (IIP). The second category includes two approaches, the intertemporal benchmark model and the macroeconomic balance, which utilize smoothing techniques to produce an optimal current account. The intertemporal benchmark model applies this technique to produce an optimal consumption-smoothing current account against which the actual current account is compared. The macroeconomic balance approach uses sustainable medium-term projections along with parameter estimates to produce the optimal current account. Some of these approaches were examined for Jamaica by Hudson and Stennett (2003). Our intention is to revisit and extend these measures.

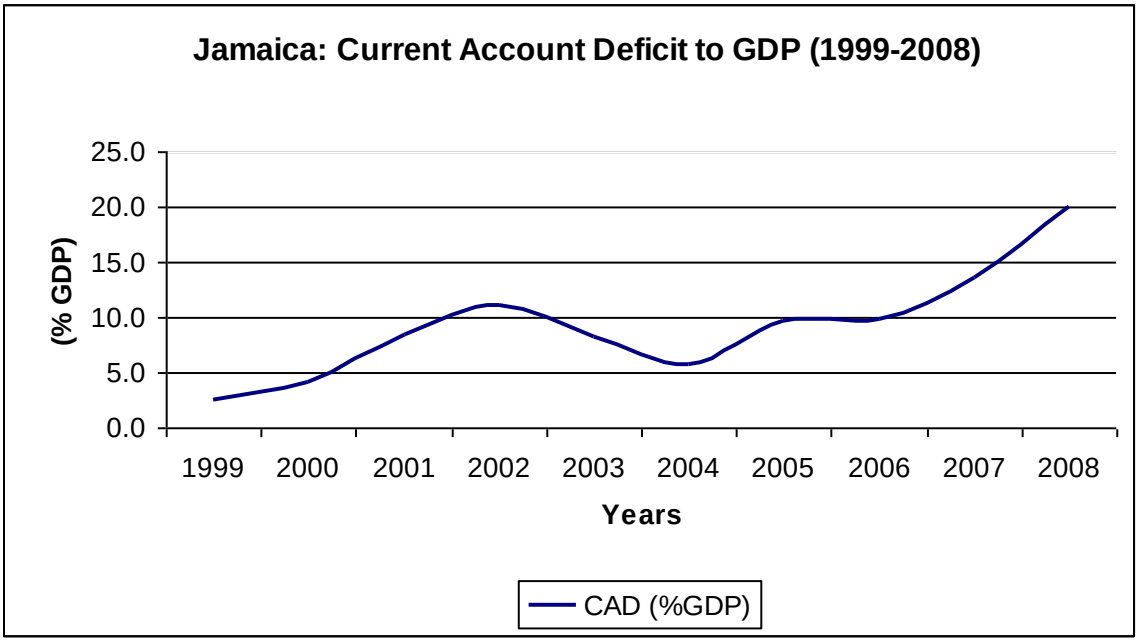
Of the seven measures of current account sustainability, six of them indicate that the Jamaican current account is unsustainable. The accounting, portfolio, macroeconomic balance and external sustainability approaches produce current account norms which are above the Bank's current projections. The variance between these two implies a likely worsening of the country's international investment position (IIP) or an increase in the country's liabilities. The present value constraint approach indicates insolvency since the present discounted value of the country's future income is insufficient to offset the stock of liabilities. The intertemporal benchmark model indicates unsustainability since the actual and optimal current accounts do not converge. However, the cointegration approach indicates weak sustainability given the correlation between the economy's inflows and outflows.

The paper is organized as follows: Section 2 looks at Jamaica's current account over the past decade; section 3 looks at the five sustainability measures which are based on net indebtedness; section 4 looks at the final two sustainability measures which utilize smoothing techniques and section 5 provides the conclusion.

2.0 JAMAICA'S CURRENT ACCOUNT: TRENDS AND DEVELOPMENTS (1999 – 2008)

Jamaica's current account balance has been consistently negative over the period 1999-2008 (see figure 1). The ratio of the current account deficit to GDP increased from 2.4 per cent in 1999 to 20.1 per cent in 2008, averaging 9.2 per cent. This is significantly above the average deficit of 2.2 per cent of GDP for a selected group of emerging market economies over the same period (see table 1, appendix). In this regard, Jamaica's CAD can be classified as large and persistent.

Figure 1



The deterioration in the current account was largely influenced by a widening of the merchandise trade deficit associated with a faster growth in imports relative to exports. Imports grew at an annual average rate of 10.6 per cent (US$453.5 million) between 1999 and 2008, compared to a 5.3 per cent (US$95.5 million) annual average growth in exports. The growth in imports between 2006 and 2008 was primarily driven by increases in world commodity prices, particularly oil. Export growth was constrained between 1998 and 2001 due to declines in earnings from Bauxite, Banana and non-traditional exports, primarily garments. The bauxite industry was negatively affected by an

explosion at Kaiser's Gramercy plant, which necessitated cutbacks in output at the local plant between 1999 and 2000. The decline in the banana industry, which began in 1999, followed a reduction in international prices due to increased competition. The EU also indicated its intention to eliminate preferential treatment for Bananas from as early as 1998. In addition, there was a scaling down or withdrawal of local operators from the garment sector.

Between 1997 and 2002, the trend deterioration was underpinned by fiscal deficits, as well as the emergence of private sector dissavings in 2000 (Hudson and Stennett, 2003). Private sector dissavings re-emerged between 2005 and 2008, averaging 7.3 percentage points of GDP (see table 2, appendix). This was largely driven by foreign direct investment inflows in the tourism sector.

3.0 SUSTAINABILITY MEASURES BASED ON NET INDEBTEDNESS

3.1 THE ACCOUNTING APPROACH

In the accounting approach, a CAD is seen as sustainable if it does not generate increases in a country's IIP, relative to its GDP. The change in the IIP is determined by the interest rate on a country's net liabilities and the size of the trade balance. An economy's external budget constraint is represented as follows:

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

where B_t is the country's IIP, i_t is the interest rate/rate of return on the economy's IIP and X-M is net earnings from the export of goods and services (including transfers). To derive the sustainability condition, equation (1) is divided through by GDP to represent the current account sustainability measure (CASM) such that:

$$(x-m)_t - \left(\frac{i_t - g_t}{1+g_t}\right) b_{t-1} = 0 . \qquad (2)$$

where g_t is the growth rate of GDP and b_{t-1} is the country's IIP to GDP ratio[2]. Thus, 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 economy's 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.

The accounting approach can also be used to establish a benchmark current account balance (referred to as a norm) against which projected deficits can be compared. The current account norm is produced by rearranging equation (2). It represents the current account balance which, if realized, would not lead to an increase in the country's liabilities and would therefore be considered sustainable.

Aristovnik (2006) makes several arguments in favour of the exclusion of FDI–related influences from the sustainable current account balance. He highlights that FDI is generally considered more stable than other financial flows as investments in fixed assets may be more difficult to liquidate given that these types of investors usually make long-term commitments. FDI flows can have a considerable and immediate positive impact on economies' external financial positions and, thus, on their development prospects since the financial effect of FDI complements its potential technological, management and restructuring impact. Further, FDI may improve foreign perceptions of the host economy's creditworthiness and thus contribute to the creation of a virtuous circle involving a reduction in borrowing costs, access to a broader range of financial instruments and more stable capital flows. In addition, FDI will increase an economy's exports and improve the current account balance in the longer term.

[2] For complete proof see Hudson and Stennett (2003).

Reisen (1998) contends that the likelihood of a balance of payments crisis is reduced if the CAD is financed largely by FDI.[3] Roubini (1998) also expresses the view that a CAD which is financed primarily by FDI is more sustainable than a deficit financed by short-term 'hot money' flows.[4] This paper includes assessments of the sustainable CAD with and without FDI.

3.1.1 RESULTS

The results for the accounting approach are presented in Table 3 in the appendix. CASM1 defines the trade balance to include only goods and services (equation (2)) while CASM1A uses the current account ballance. For the period 2004/05 to 2007/08, the first current account sustainability measure (CASM1, as defined by expression (2)) was negative. It fell from -0.14 in FY2004/05 to -0.21 in FY2007/08. CASM1 remains negative over the forecast horizon, albeit with an improving trend. CASM1A, which takes transfers and income into account, is significantly smaller than CASM1, reflecting 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. The sign and trend of these measures of sustainability confirm that the net external debt of the country is likely to continue growing over the medium-term and the CAD is therefore unsustainable.

The current account norm calculations based on the accounting approach are presented in Table 3 in the appendix. Excluding FY 2009/10, the average norm deficit over the forecast horizon is 4.7 per cent of GDP. The average current account deficit projected for this period is 8.9 per cent of GDP. Between FY 2008/09 and FY 2009/10, a sharp

[3]Reisen highlights the fact that while Singapore ran an average deficit of 12.1 per cent of GDP between 1972 and 1982, almost half of the corresponding net capital inflows consisted of FDI. However, of great significance is that, over the period, GDP growth averaged more than 8.6 per cent of GDP and the domestic rate of saving doubled from 21.0 per cent to 40.0 per cent.

[4] However, he warns that foreign currency debt may end up exacerbating an exchange rate crisis as a real depreciation leads to an increase in the real burden of foreign debt. An existing large burden of international debt will make it more difficult to finance a current account imbalance. Moreover, a large debt burden can exhaust export revenues and preclude imports of investment goods that are needed for growth. In such a case the debt burden can create a trap that inhibits any growth policies.

depreciation of the exchange rate is projected to lead to a growth rate of nominal GDP of -10.3 per cent. This produced a current account norm of +17.4 per cent for FY 2009/10.

3.2 THE EXTERNAL SUSTAINABILITY APPROACH

The external sustainability approach (ES) is similar to the accounting approach in that they both require that the growth rate of GDP be sufficient to offset the growth of the country's liabilities. The main difference is that the ES approach disaggregates GDP growth into real growth and inflation.

Similar to the accounting approach, the ES framework defines sustainability by the stability of the IIP relative to the size of the economy. To determine the level of the current account balance that stabilizes the IIP at a given level, the accumulation equation for net foreign assets (represented by B_t) is employed. This equation states that changes in net foreign assets can arise from either net financial flows from the purchases or sale of assets by residents and non-residents or to changes in the valuation of outstanding foreign assets and liabilities:

$$B_t - B_{t-1} = CA_t + KG_t + E_t \qquad (3)$$

CA_t is the current account balance and KG_t are capital gains arising from valuation changes. E_t, which is often assumed to be relatively small or zero, includes factors such as capital account transfers and errors and omissions. With the assumption that E = 0, the current account and net financial flows should be equal (IMF, 1998).

Dividing both sides of equation (3) by nominal GDP in period t we have

$$\frac{B_t}{Y_t} - \frac{B_{t-1}}{Y_{t-1}} * \frac{Y_{t-1}}{Y_t} = \frac{CA_t}{Y_t} + \frac{KG_t}{Y_t} \qquad (4)$$

Equation (4) can be expressed as:

$$b_t - b_{t-1} * \frac{1}{(1+g_t)(1+\pi_t)} = ca_t + kg_t \quad [5] \qquad (5)$$

where g_t is the growth rate of real GDP and π_t is the exchange rate adjusted inflation rate.

Equation (5) therefore becomes:

$$b_t - b_{t-1} = ca_t + kg_t - \frac{g_t + \pi_t(1+g_t)}{(1+g_t)(1+\pi_t)} b_{t-1} \qquad (6)$$

If it is further assumed that capital gains are zero and the benchmark level of NFA is denoted by b^S, the current account that stabilizes NFA at b^S is:

$$ca^s = \frac{g + \pi(1+g_t)}{(1+g)(1+\pi)} b^s . \qquad (7)$$

In order to estimate the NFA-stabilizing current account balance, assumptions must be made regarding the targets for potential growth and the inflation rate over the medium-term.

Choosing a benchmark for the NFA position is somewhat arbitrary. The IMF's Consultative Group on Exchange Rates (CGER) uses a backward-looking benchmark (latest actual value). A more forward looking target can be taken which is consistent with external sustainability (IMF, 1998). This paper calculates norms for an IIP which is fixed and for an IIP which improves over time.

3.2.1 RESULTS

For the calculations, a target inflation rate of 2.0 per cent and real GDP growth of 3.0 per cent over the medium-term are assumed. The results suggest that the deficit will remain unsustainable over the medium-term, as the sustainable current account deficit is

[5] This is so, given that: $Y_t = Y_{t-1}(1+g_t)(1+\pi_t)$

estimated to be 5.8 per cent of GDP (see Table 5, appendix). The second set of calculations were carried out based on an IIP which improves over time and reaches 100.0 per cent of GDP by FY 2012/13 from 116.4 per cent of GDP in FY 2008/09. The results showed a current account deficit which improved over time moving from 5.8 per cent of GDP in FY 2008/09 to 5.0 per cent of GDP in FY 2012/13 (see Table 6, appendix).

3.3 THE PORTFOLIO APPROACH

An extension of the accounting approach is the portfolio approach which posits that sustainable CADs depend on the variables that affect portfolio decisions as well as economic growth. According to this approach, the CAD is sustainable if the debt-to-GDP as well as the reserve-to-GDP ratios are constant.

Long-run GDP growth exerts two indirect effects on the steady-state current account that are consistent with a stable debt-to-GDP ratio. First, as the economy expands, the desired level of international reserves (*fx*) grows. The literature on the demand for international reserves identifies the level of imports and the variability of the balance of payments as the two main determinants (Resein, 1998). The desired level of reserves is given as a quarter of the import ratio (three months of imports). By creating uncertainty, BOP variability increases the demand for reserves. In principle, uncertainty in the balance of payments can be incorporated into the analysis by making predictions about the coefficient of variation from the time trend in the foreign reserve ratio. For the purpose of this analysis, however, uncertainty is ignored.

Denoting real annual import growth by η and g as the GDP growth rate, the change in the desired reserve to GDP ratio (fx) can be written as:

$$\Delta fx = \left[\frac{(1+\eta)}{(1+g)}\right] fx - fx \tag{8}$$

A second channel through which GDP growth indirectly impacts on debt dynamics is the Balassa-Samuelson effect. In the long-run, growth relative to the rest of the world leads to real exchange rate appreciation largely driven by the evolution of productivity differentials between the domestic economy and the rest of the world. Real exchange rate appreciation per unit of GDP growth, denoted by ε, reduces both debt and foreign exchange reserves as a fraction of GDP as follows:

$$(g+\varepsilon)d = CAD + \left[\frac{(\eta+\varepsilon-g)}{(1+g)}\right] fx \tag{9}$$

Equation 9 describes the steady-state CAD that can be sustained over the long-run if the debt ratio remains constant and desired reserves rise in proportion to import growth.

Following Aristovnik (2006), the sustainable CAD can be estimated as follows:

$$CAD = (g+\varepsilon)d - \left[\frac{(\eta+\varepsilon-g)}{(1+g)}\right] fx - fdi \tag{10}$$

3.3.1 RESULTS

The variable λ is taken as the average annual growth rate of potential GDP. ε is the historical drift of the real effective exchange rate per unit of GDP growth which is the percentage change in the real effective exchange rate relative to the growth rate of real GDP. The target level of foreign exchange reserves (fx) is taken to be 3 months of imports to GDP. η is the growth rate of real imports, d is the ratio of tolerable external debt-to-GDP and fdi is the ratio of foreign direct investment to GDP.

The portfolio approach indicates an average current account norm over the forecast horizon of -0.6 per cent of GDP excluding FDI and -6.3 per cent of GDP including FDI. A high level of FDI associated with inflows from Angostura pushed the sustainable current account to -14.8 per cent of GDP in FY 2007/08 (see Table 4, appendix).[6]

3.4 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 nominal terms and not as ratios to GDP, as in the accounting approach. To derive the solvency condition, recall the expression that defines the evolution of the country's net indebtedness:

$$B_{t-1} = \frac{B_t}{1+r_t} + \frac{(X-M)_t}{1+r_t} \tag{11}$$

All the variables are the same as in the accounting approach but expressed in the unit of the domestic currency in real terms. 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

$$B_{t-1} = \sum_{j=0}^{N} \frac{(X-M)_{t+j}}{(1+r)^{j+1}} + \frac{B_{t+N}}{(1+r)^{t+N}} \tag{12}$$

[6] These flows were related to the acquisition of Lascelles de Mercado by the Trinidadian firm Angostura.

The "no ponzi game" (NPG) condition, $\lim_{N\to\infty} \frac{B_{t+N}}{(1+r)^{t+N}} = 0$, 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[7].

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:

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

Milesi-Ferretti and Razin (1996) are strongly critical of sustainability analyses that focus exclusively on solvency conditions. They note that such analyses are 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.

3.4.1 RESULTS

This approach was used to calculate two measures based upon a variable rate of interest and a fixed rate of interest. Both measures indicate unsustainability given that the net earnings of the economy, over the long run, will likely be insufficient to offset the current

[7] 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.

level of indebtedness of the economy. The two measures were 0.84 and 0.85, respectively, where any result greater than zero indicates unsustainability.

3.5 COINTEGRATION

Husted (1992) noted that it is useful to test import and export for cointegration because if a long-run relationship exists between the two, the series would not drift 'too far' apart and the resulting current account balance may then be considered sustainable.

Ongan (2008) sought to highlight the contribution of the tourism sector to the sustainability of the CAD in Turkey. Cointegration tests were used to evaluate the long-run relationship between exports + tourism receipts (X + TR) and imports + tourism expenditures (M + TE) for the period of 1980-2005. Ongan (2008) assessed the weak sustainability hypothesis from the cointegrating vector which is given as:

$$(X + TR)_t = a + b(M + TE)_t + \eta_t. \qquad (14)$$

where X is exports, TR is tourism revenue, M is imports, TE is tourism expenditure and η_t is the error term.

In this vector, if b is equal to one and η_t is stationary, then the CADs are strongly sustainable. If b is between 0 and 1($0 < b < 1$) and η_t is stationary or $b = 1$ but η_t is non-stationary, then the CADs are weakly sustainable. If there is no cointegration or $b = 0$, then the CADs are unsustainable.

3.5.1 RESULTS

For Jamaica, three equations were calculated to assess the size of *b* using OLS and quarterly data over the period 2000 to 2008. Table 7 considers the relationship between exports and imports. Table 8 considers the effect of exports and tourism inflows on

imports and tourism outflows. Table 9 sums exports, tourism receipts and the inflows of current transfers and assesses this against imports, tourism outflows and outflows of current transfers.

The residual of the long-run relationship between imports and exports was found to be stationary. In addition, from the tests of cointegration, the value of b falls between 0 and 1 in all equations and the residuals were all found to be stationary. Based on the conditions outlined in Ongan (2008), the Jamaican current account is weakly sustainable. The value of b increases from 0.29 to 0.46 to 0.77 as more variables are added to the equation.

4.0 SUSTAINABILITY MEASURES BASED ON SMOOTHING TECHNIQUES

4.1 Intertemporal Benchmark Models

Intertemporal benchmark models (IBMs) provide predictions about the optimal or equilibrium path of external imbalances against which the actual current account balance can be compared. A key assumption of such models is that consumers use savings to smooth consumption over the periods when their income is expected to decline, and thus, economic agents 'save for a rainy day' when they expect a future decline in household income (Campbell, 1987).

In this regard, the consumer maximizes an inter-temporal consumption function

$$E_t \sum_{j=0}^{\infty} \beta^i u(c_{t+j}), \quad 0 < \beta < 1, \tag{15}$$

subject to his budget constraint $\Delta b_{t+1} = rb_t - (y_t - c_t - i_t - g_t)$ where c_t is private consumption, U(.) is a separable utility function and β is the subjective discount factor. b_t denotes the economy's stock of net external liabilities at the beginning of period *t*, y_t denotes real gross national income, i_t is real investment, g_t is real government consumption and r_t is the interest rate on the economy's net external liabilities.

The optimal level of consumption c^*_t then becomes:

$$c^*_t = (r/\oplus)\left[-b_t + (1+r)^{-1} E_t\left(\sum_{j=0}^{\infty}(1+r)^{-j} z_{t+j}\right]\right. \quad (16)$$

where $\oplus$ is the consumption tilting parameter and $z_t = y_t - i_t - g_t$ which is defined as the national cash flow. The consumption tilting parameter indicates the portion of the current account that would occur if the national cash flow was at its permanent level (Ghosh and Ostry, 1995).

Based on the optimal path of consumption, the optimal current account can be specified using the national income identity such that:

$$ca^*_t = y_t - i_t - g_t - \oplus c^*_t \quad (17)$$

When $\oplus = 1$, the consumption tilting component is zero. For $\oplus > 1$ the economy is saving or tilting consumption to the future. For $\oplus < 1$, the economy is dissaving or tilting consumption to the present (Ghosh and Ostry, 1995).

Since consumption is assumed to vary based on expected changes in national income i.e. the consumption tilting parameter is not equal to unity, the actual current account must be detrended to remove this component. The optimal current account can then be compared to the smoothed/detrended actual current account.

The consumer's budget constraint is used to produce the consumption smoothing component of the current account which is given by:

$$CA_t = -E\left[\sum_{j=1}^{\infty}(1+r)^{-j}\Delta z_{t+j}\right] \quad (18)$$

To derive the optimal consumption-smoothing current account, (18) must be estimated. Ghosh and Ostry (1995) estimated an unrestricted VAR of the form:

$$\begin{bmatrix} \Delta z_t \\ ca_t^{sm} \end{bmatrix} = \begin{bmatrix} \psi_{11} & \psi_{12} \\ \psi_{21} & \psi_{22} \end{bmatrix} \begin{bmatrix} \Delta z_{t-1} \\ ca_{t-1}^{sm} \end{bmatrix} + \varepsilon_t \qquad (19)$$

The consumption-smoothing current account, ca_t^{sm}, is the residuals of the cointegrating relationship between private consumption (c_t) and the national cash flow (z_t) regression.

The first implication of the model is that the current account Granger-causes subsequent movements in national cash flow. This hypothesis can be tested using the standard t-statistic on Ψ_{12} from expression (19). If this parameter is negative and significant, then the current account Granger-causes national cash flow and the predicted (optimal) series is equal to the actual series (Ghosh and Ostry, 1995).

As shown in Campbell (1987), an implication of the permanent income hypothesis is that savings will increase when income declines and vice versa. In this context, there is a current account surplus when net output is expected to decline and a CAD when net output is expected to increase.

The formal test of sustainability 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:

$$ca_t^* = -\frac{[10]}{(1+r)}\Psi\left[\frac{(I-\Psi)}{(1+r)}\right]^{-1} x_t \qquad (20)$$

The actual current account balance is given by $[01]x_t$. The two will be equal if and only if

$$-\frac{[10]}{(1+r)}\Psi\left[\frac{(I-\Psi)}{(1+r)}\right]^{-1} = [01] \qquad (21)$$

This implies that $\Psi_{11} = \Psi_{21}$ and $\Psi_{22} - \Psi_{12} = (1+r)$ (Ghosh and Ostry, 1995). These parameters are produced by estimating the VAR given in equation (19).

The third implication of the model is the equality of the variance between the actual and the optimal consumption smoothing current account. Hypothesis testing can then be used to assess the severity of the deviation of actual current account from the predicted optimal balance. An above-normal deviation exists when $D \geq \mu + 1.5\delta$ and a large deviation exists when $D \geq \mu + 3\delta$ where D is the deviation of the actual current account from the predicted optimal balance μ is the mean deviation over the sample and δ is the standard deviation (Hudson and Stennett, 2003).

A caveat relates to the behavioural assumptions in the model which state that consumers can perfectly smooth their consumption over time and that this can only be done via the current account. Campa and Gavilan (2006) note mixed results in the literature regarding whether consumers perfectly smooth their consumption over time. In addition, there is also concern about whether the current account is the only instrument which consumers can use to smooth consumption. Fluctuations in investment and other domestic spending may also be correlated with consumption.

4.1.1 RESULTS

Annual data from 1961 to 2007 from the National Income and Product Accounts as well as the Bank of Jamaica were used. The interest rate on the economy's net external liabilities, r_t, was assumed to be the average of the interest rates on the country's commercial and multilateral loans from 2000-2007. The variables c_t and z_t were both I (1) based on the Augmented Dickey Fuller test for unit roots (see Table 10, appendix).

In order to estimate the consumption tilting parameter, the long-run relationship between z_t and c_t was assessed using the Engle-Granger two-step approach. This differs from the

vector error correction model (VECM) employed by Hudson and Stennett (2003). The approach was chosen since the attempt at using the VECM did not produce significant coefficients for the cointegrating vector. The consumption tilting parameter, $\oplus$, was produced from the OLS regression of z_t on c_t. This parameter was found to be 0.98 and since it is less than one, the country is tilting consumption towards the present i.e. it is consuming more than its permanent cash flow (see Table 11, appendix).

The presence of a single cointegrating equation between z_t and c_t is a necessary condition for the estimation of the de-trended current account. For the Engle-Granger approach, ordinary t-statistics are unreliable with I(1) regressors and therefore cannot be used to evaluate the properties of the residual. The McKinnon critical values are appropriate in this instance and these indicated that the residuals from the long-run relationship were non-stationary. However, the short-run error correction model produced stationary residuals. The coefficient on the error correction term was also significant and negative indicating that a cointegrating relationship exists. This suggests that Jamaica did not breach the intertemporal solvency condition over the period (see Table 12, appendix). The residual from the dynamic equation was then used to estimate the detrended current account.

The long-run test of sustainability suggests that the predicted and actual current accounts do not converge as Ψ_{11} - Ψ_{21} = 5.11 which is significantly different from zero, while Ψ_{22} - Ψ_{12} = 0.53 $\neq$ 1.07. The average deviation over the sample was 3.6, which indicates that the actual current account was, on average, above the optimal current account over the four decades. The average deviation from 2003 to 2007 was 5.8 which signals a sharp change in the country's external position given that the actual current account was consistently and significantly over the optimal for that period. Table 13 presents the parameters of the fitted VAR defining the optimal current account. The

model is valid because Ψ_{12} is appropriately signed and significant, indicating that the current account Granger-causes the national cash flow.[8]

Figure 2

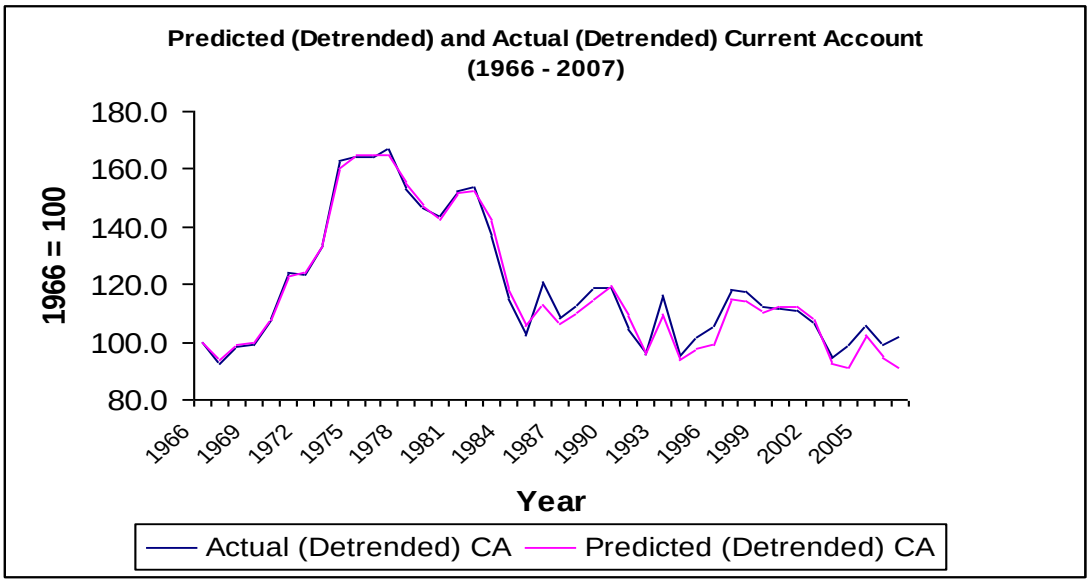


Figure 2 plots the actual current account and the predicted current account over the period 1966-2007. The graph also reveals that the CAD more closely conformed to the optimal balance between 1966 and 1986, compared with the period 1987 to 2007. For the first period, the average deviation was –0.15, compared with an average deviation of 2.6 in the second period. The volatility in the deviations was also less in the earlier period, reflecting a standard deviation of 1.2, compared with 3.5 for the latter period.

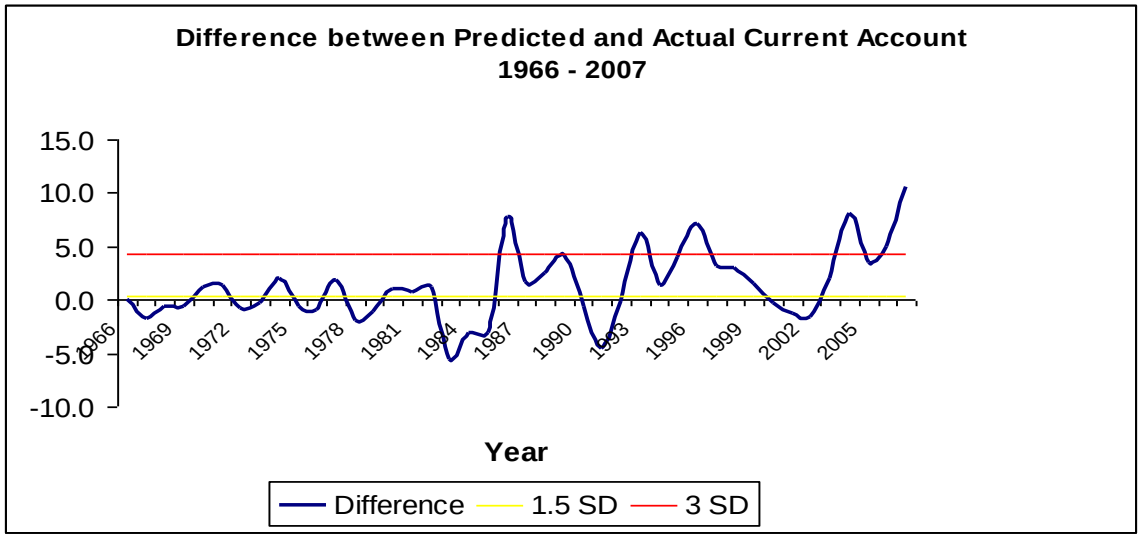
The closer correspondence between the actual and optimal current account balances over the earlier period may be explained by relatively more restricted access by Jamaicans to international financing. This restriction may have been the result of capital controls, IMF/World Bank agreements which restricted the state's 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

[8] Ψ_{12} is -4.8 with an associated t-statistic which is greater than 2.0.

consumption expenditure from straying too far from the national cash flow (Hudson and Stennett, 2003). There was marked deviation between the two series at the end of the sample period.

The imbalance breached 1.5 standard deviations numerous times over the sample period. Three standard deviations were breached in 1986, 1993, 1995, 2005 and 2007 (see Figure 3).

Figure 3



4.2 THE MACROECONOMIC BALANCE APPROACH

Current account norms are also estimated as the equilibrium relationship between current account balances and a set of fundamentals that are projected to be sustainable in the medium-term. The current account norm therefore reflects a baseline forecast that assumes that the country's output gap is closed and that the full impact of previous exchange rate movements has been played out.

The IMF (2001) projects the equilibrium current account as a function of, *inter-alia*, the fiscal balance; demographics; net foreign assets (NFA); relative income squared; openness and financial deepening. A reduction in the fiscal deficit should raise national savings and thereby lead to a decline in the CAD. Demographics are measures of dependency and reflect the fact that a higher share of inactive dependent population reduces national saving and decreases the current account balance. Growth in the young-age dependency ratio serves to reduce the current account balance. Youth dependency is captured by the proportion of the population under 14 years to the industrial country average. Economies with relatively high NFA can afford to run trade deficits on an extended basis and still remain solvent, potentially leading to a negative association between NFA and the current account. The relationship between the two can be positive, however, as economies with high NFA may benefit from higher net foreign investment inflows.

Relative per capita income is included since relatively poorer countries are expected to import capital, both physical and financial, for domestic investment which reverses with rising income. This variable is squared given the nonlinear relationship with the current account. This is based on the hypothesis that at relatively low stages of development, increases in income would tend to improve a country's access to foreign capital while at advanced stages of development the correlation between income and the current account would become positive (or less negative).

The latter part of the hypothesis reflects the notion that countries at the highest income levels and most advanced stages of development tend to be capital exporters, an implication of the negative relationship between the abundance of existing capital and the marginal returns on additional investments (IMF 2001). The variable is measured relative to the United States. Openness is measured as imports plus exports as a share of GDP and financial deepening is measured as the ratio of broad money to GDP.

The approach used to establish the current account norm involves calibration based on the parameters published by the IMF for developing countries (see Table 14, appendix).

The current account norm is estimated using the medium-term projections for all the variables. An improvement in these variables in the medium-term will lead to an improved current account position.

The main criticisms of this approach are that the calculations of the norm rely on projections and are subject to significant uncertainty. Medium-term projections for the current account might change over time as a result of changes in other variables.

Wren-Lewis and Driver (1998) distinguish four sources of such changes. First, there may be a trend in some components of trade, such as a declining (world) export share. Second, trend rates of GDP growth at home and abroad might differ. This can imply a different rate of change for exports and imports and thus a change in the trade balance. Third, estimated income elasticities may be different for exports and imports. Then, even if domestic output grows at the same trend rate as foreign output, the trade balance (and therefore the underlying current account) would change (Dvornak, 2005). Fourth, the approach does not impose a stock equilibrium. A non-zero current account target implies a continuing change in the net foreign asset position. For instance, a country that runs an underlying CAD lowers debt interest receipts since it is not a lender and further increases the CAD (the reverse holds for a country in surplus). This would require a trend depreciation unless GDP grows at the same rate as the net foreign asset position (Dvornak, 2005).

4.2.1 RESULTS

The results indicate current account unsustainability in FY 2008/09, FY 2009/10 and FY 2010/11. However, over the remainder of the sample period, the norm remains largely unchanged while the projection is for an improved current account position. The current account is therefore projected to be sustainable for FY 2011/12 and FY 2012/13 (See Table 15, appendix).

5.0 CONCLUSION

Of the seven approaches used to evaluate the sustainability of the Jamaican current account, five indicate that the current account is unsustainable while the macroeconomic balance approach indicates sustainability by FY 2011/12 and the cointegration approach indicates weak sustainability. In addition, while the ITBM found that Jamaica did not breach the solvency condition over the sample period, the long-run test also showed unsustainability of the deficit. The accounting, portfolio, present value constraint and external sustainability approaches all point towards unsustainability of the CAD.

Hudson and Stennett (2003) point out that the assessment of the Jamaican current account shows the need for fairly dramatic and immediate adjustments in macroeconomic and structural policies. They argue that while fiscal policy adjustments are required, there is also need for initiatives aimed at stimulating relatively large growth in the real sector, targeted principally at tradable goods and services.

Persistently large CADs are usually an indication of structural weaknesses within an economy. Once the value of a country's receipts are significantly less than the value of its earnings for a sustained period, there is need to perform an evaluation of the features of the economy that relate to the production of goods and services and by extension the goods and services demanded of foreigners. Furthermore, the dependence on remittances and industries such as mining and tourism which involve a significant degree of profit repatriation and which are highly vulnerable to changes in the world economy reinforces the view that Jamaica's economy is structurally unsound.

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7.0 APPENDIX

Table 1

Selected Emerging Market Economies Current Account (% GDP) 1999-2008											
Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average (1999-2008)
Argentina	-4.2	-3.2	-1.4	8.9	6.3	2.1	2	2.6	1.7	0.8	1.6
Chile	0.1	-1.2	-1.6	-0.9	-1.1	2.2	1.2	4.7	4.4	-1.1	0.7
Costa Rica	-3.8	-4.3	-3.7	-4.9	-5	-4.3	-5.2	-4.9	-5.8	-7.8	-5.0
Croatia	-7.7	-2.9	-3.7	-8.4	-6.2	-5	-6.3	-7.9	-8.6	-10.1	-6.7
Dominican Rep.	-2	-4.2	-3	-3.6	4.9	4.8	-1.4	-3.6	-5.4	-13.5	-2.7
Egypt	-1.9	-1.2	0	0.7	2.4	4.3	3.2	0.8	1.5	0.6	1.0
Hungary	-7.8	-8.4	-6	-7	-7.9	-8.4	-6.8	-6.1	-5	-5.5	-6.9
Ireland	0.2	-0.4	-0.6	-1	0	-0.6	-3.5	-3.6	-5.4	-5	-2.0
Israel	-1.3	-0.8	-1.1	-0.8	1.2	2.4	3.2	5.9	3.2	0.4	1.2
Jamaica	**-2.4**	**-4.1**	**-8.3**	**-11.1**	**-8.2**	**-4.9**	**-9.6**	**-9.9**	**-13.5**	**-20.1**	**-9.2**
Peru	-3.4	-2.8	-2.1	-1.9	-1.5	0	1.4	3	1.4	-2	-0.8
Poland	-6.9	-5.8	-2.8	-2.5	-2.1	-4	-1.2	-2.7	-3.8	-4.7	-3.7
Turkey	-0.4	-3.7	2	-0.3	-2.5	-3.7	-4.6	-6	-5.7	-6.5	-3.1
Source: IMF											

Table 2

Current Account Decomposition						
	2003	**2004**	**2005**	**2006**	**2007**	**2008**
Current Account/GDP	**-8.2**	**-4.9**	**-9.6**	**-9.9**	**-13.5**	**-20.1**
Public Dissavings	-15.3	-11.4	-8.8	-6.4	-4.1	-6.4
Central Government	-12.2	-9.2	-8.2	-7.1	-6.3	-6.3
Other Public Entities	-3.1	-2.2	-0.6	0.7	2.2	-0.1
Private Financing	7.1	6.5	-0.8	-3.5	-9.4	-15.5
FDI/GDP	-7.7	-5.9	-6.1	-7.4	-6.7	-9.6
Other Private Dissavings	14.8	12.4	5.3	3.9	-2.7	-5.9
Memo						
Current Account	-772.4	-500.42	-1071.43	-1182.64	-1739.87	-3233.1
GDP (USMN)	9392.7	10134.2	11134.8	11983.6	12899.2	14768.1

Table 3

Indicators of Current Account Sustainability									
FY2004/05 - FY2012/13									
	Actual					Projected			
Fiscal Year	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2011/12**	**2012/13**
CASM1*	-0.14	-0.16	-0.19	-0.21	-0.26	-0.40	-0.19	-0.16	-0.16
CASM1A**	-0.05	-0.08	-0.09	-0.10	-0.15	-0.28	-0.05	-0.03	-0.04
Current Account Norm	**-1.4**	**-2.4**	**-0.2**	**-5.0**	**-3.4**	**17.4**	**-4.7**	**-5.1**	**-4.2**
Current Account/GDP	-6.2	-10.4	-9.3	-15.3	-18.5	-9.0	-10.1	-8.4	-8.1
Goods & Services (% of GDP)	-15.0	-18.6	-19.5	-25.5	-29.1	-22.9	-23.4	-21.5	-20.7
Goods, Services & Transfers (% of GDP)	-0.4	-4.6	-4.4	-10.0	-14.8	-7.8	-8.8	-7.3	-6.9
Interest Rate on Net External Liabilities (%)	7.1	7.3	5.7	5.6	4.4	3.7	2.8	2.6	2.6
GDP Growth Rate (% Chge, Nominal US$)	8.4	9.7	5.9	11.0	8.2	-10.3	6.9	6.6	5.8
Sustainability Scenario									
GDP Growth Rate (% Change in US$)	7.1	7.3	5.7	5.6	4.4	3.7	2.8	2.6	2.6

Table 4

Sustainable Current Account (%GDP)			
	Accounting Approach	Portfolio Approach No FDI	Portfolio Approach With FDI
2005/06	-2.4	-1.8	-8.3
2006/07	-0.2	0.0	-7.2
2007/08	-5.0	-2.8	-14.7
2008/09	-3.4	-0.5	-5.8
2009/10	17.4	-0.6	-5.1
2010/2011	-4.7	-0.7	-8.0
2011/2012	-5.1		
2012/2013	-4.2		

Table 5

ES Approach Results (%GDP)			
	IIP	Ca^s	CA (proj.)
2008/09	-116.4	-5.8	-19.4
2009/10	-116.4	-5.8	-17.2
2010/11	-116.4	-5.8	-16.8
2011/12	-116.4	-5.8	-14.8
2012/13	-116.4	-5.8	-14.3

Table 6

ES Approach Results (%GDP)			
	IIP	Ca^s	CA (proj.)
2008/09	-1.16	-5.8	-19.4
2009/10	-1.10	-5.5	-17.2
2010/11	-1.08	-5.4	-16.8
2011/12	-1.04	-5.2	-14.8
2012/13	-1.00	-5.0	-14.3

Table 7

Dependent Variable: EXPORTS
Method: Least Squares
Date: 04/16/09 Time: 15:08
Sample: 2000Q1 2008Q3
Included observations: 35

	Coefficient	Std. Error	t-Statistic	Prob.
C	132.9084	22.75765	5.840162	0.0000
IMPORTS	0.290692	0.020649	14.07750	0.0000

R-squared	0.857252	Mean dependent var	437.9078
Adjusted R-squared	0.852926	S.D. dependent var	107.4400
S.E. of regression	41.20350	Akaike info criterion	10.33037
Sum squared resid	56025.02	Schwarz criterion	10.41925
Log likelihood	-178.7814	Hannan-Quinn criter.	10.36105
F-statistic	198.1760	Durbin-Watson stat	1.118053
Prob(F-statistic)	0.000000		

Table 8

Dependent Variable: XTOUR
Method: Least Squares
Date: 04/16/09 Time: 15:08
Sample: 2000Q1 2008Q3
Included observations: 35

	Coefficient	Std. Error	t-Statistic	Prob.
C	305.7326	39.29481	7.780483	0.0000
MTOUR	0.460991	0.033744	13.66144	0.0000

R-squared	0.849751	Mean dependent var	818.7930
Adjusted R-squared	0.845198	S.D. dependent var	173.8490
S.E. of regression	68.40075	Akaike info criterion	11.34409
Sum squared resid	154395.9	Schwarz criterion	11.43297
Log likelihood	-196.5216	Hannan-Quinn criter.	11.37477
F-statistic	186.6349	Durbin-Watson stat	0.881624
Prob(F-statistic)	0.000000		

Table 9

Dependent Variable: ALLINFL
Method: Least Squares
Date: 04/16/09 Time: 15:09
Sample: 2000Q1 2008Q3
Included observations: 35

	Coefficient	Std. Error	t-Statistic	Prob.
C	297.9928	49.60958	6.006758	0.0000
ALLOUTFL	0.772501	0.040016	19.30470	0.0000

R-squared	0.918653	Mean dependent var	
Adjusted R-squared	0.916188	S.D. dependent var	290.5005
S.E. of regression	84.10061	Akaike info criterion	11.75735
Sum squared resid	233406.1	Schwarz criterion	11.84623
Log likelihood	-203.7536	Hannan-Quinn criter.	11.78803
F-statistic	372.6715	Durbin-Watson stat	0.787552
Prob(F-statistic)	0.000000		

Table 10

Null Hypothesis: LCT has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.829750	0.9999
Test critical values:	1% level	-2.616203	
	5% level	-1.948140	
	10% level	-1.612320	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCT)
Method: Least Squares
Date: 12/31/08 Time: 16:07
Sample (adjusted): 1962 2007
Included observations: 46 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
LCT(-1)	0.008117	0.002120	3.829750	0.0004

R-squared	-0.010167	Mean dependent var	0.062942
Adjusted R-squared	-0.010167	S.D. dependent var	0.109231
S.E. of regression	0.109785	Akaike info criterion	-1.559083
Sum squared resid	0.542375	Schwarz criterion	-1.519330
Log likelihood	36.85891	Hannan-Quinn criter.	-1.544191
Durbin-Watson stat	1.458411		

Null Hypothesis: LZT has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)

	t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		3.331182	0.9996
Test critical values:	1% level	-2.616203	
	5% level	-1.948140	
	10% level	-1.612320	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LZT)
Method: Least Squares
Date: 12/31/08 Time: 16:09
Sample (adjusted): 1962 2007
Included observations: 46 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
LZT(-1)	0.007792	0.002339	3.331182	0.0017

R-squared	-0.006735	Mean dependent var	0.059229
Adjusted R-squared	-0.006735	S.D. dependent var	0.118589
S.E. of regression	0.118988	Akaike info criterion	-1.398092
Sum squared resid	0.637114	Schwarz criterion	-1.358339
Log likelihood	33.15612	Hannan-Quinn criter.	-1.383201
Durbin-Watson stat	1.842257		

Table 11

Dependent Variable: LZT
Method: Least Squares
Date: 12/31/08 Time: 09:19
Sample: 1961 2007
Included observations: 47

	Coefficient	Std. Error	t-Statistic	Prob.
LCT	0.979336	0.011948	81.96475	0.0000
C	0.020671	0.091652	0.225543	0.8226

R-squared	0.993346	Mean dependent var	7.489687
Adjusted R-squared	0.993199	S.D. dependent var	0.815722
S.E. of regression	0.067274	Akaike info criterion	-2.518479

Sum squared resid	0.203658	Schwarz criterion	-2.439749
Log likelihood	61.18425	Hannan-Quinn criter.	-2.488852
F-statistic	6718.220	Durbin-Watson stat	0.785552
Prob(F-statistic)	0.000000		

Table 12

Dependent Variable: DLZT
Method: Least Squares
Date: 12/30/08 Time: 13:05
Sample (adjusted): 1966 2007
Included observations: 42 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
DLCT(-1)	0.251653	0.375366	0.670420	0.5074
DLCT(-2)	-0.234724	0.351331	-0.668099	0.5089
DLCT(-3)	-0.695050	0.356851	-1.947732	0.0603
DLCT(-4)	-0.178439	0.168532	-1.058781	0.2976
RESID04(-1)	-1.178285	0.405053	-2.908962	0.0065
DLZT(-1)	-0.052516	0.352183	-0.149117	0.8824
DLZT(-2)	0.042158	0.328068	0.128505	0.8986
DLZT(-3)	0.473810	0.318849	1.486003	0.1471
LCT	-1.282108	0.330603	-3.878093	0.0005
LZT	1.316959	0.336470	3.914045	0.0004

R-squared	0.459425	Mean dependent var	0.059043
Adjusted R-squared	0.307389	S.D. dependent var	0.124129
S.E. of regression	0.103304	Akaike info criterion	-1.498028
Sum squared resid	0.341494	Schwarz criterion	-1.084297
Log likelihood	41.45858	Hannan-Quinn criter.	-1.346379
Durbin-Watson stat	2.143819		

Table 13

Vector Autoregression Estimates

Date: 12/30/08 Time: 09:00
Sample (adjusted): 1967 2007
Included observations: 41 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DZT	DETREND2
DZT(-1)	0.352712	0.000927
	(0.15308)	(0.00705)
	[2.30410]	[0.13148]
DETREND2(-1)	-4.753711	0.878816
	(1.68510)	(0.07764)
	[-2.82102]	[11.3187]
C	683.2554	14.43026
	(208.741)	(9.61796)
	[3.27322]	[1.50034]
R-squared	0.280205	0.772781
Adj. R-squared	0.242321	0.760822
Sum sq. resids	2113540.	4487.044
S.E. equation	235.8378	10.86647
F-statistic	7.396392	64.61966
Log likelihood	-280.6077	-154.4317
Akaike AIC	13.83452	7.679596
Schwarz SC	13.95990	7.804979
Mean dependent	164.0220	119.9098
S.D. dependent	270.9385	22.21916
Determinant resid covariance (dof adj.)		4805704.
Determinant resid covariance		4128160.
Log likelihood		-428.6365
Akaike information criterion		21.20178
Schwarz criterion		21.45255

Table 14

IMF Parameters	
Fiscal Balance	0.26
NFA	0.04
Relative Income Squared	0.27
Youth Dependency	-0.06
Openness	-0.02
Financial Deepening	0.04

Source: (IMF 2001)

Table 15

MB Approach Results	CA Norm (%GDP)	CA (proj.) (%GDP)
2007/08	-16.5	-16.3.
2008/09	-16.9	-19.5
2009/10	-16.1	-17.1
2010/11	-15.8	-16.6
2011/12	-15.5	-14.7
2012/13	-15.3	-14.2