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The Impact of Capital Account Liberalisation in the Caribbean

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1. Introduction

It is often argued that capital account liberalisation has provided the main impetus for the considerable surge in cross border capital flows over the past two decades. At the same time, the literature attests to the fact that capital account liberalisation entails a great deal of risks to developing countries because opening up the capital account can be destabilising, to the extent that it can increase the vulnerability of these countries to external shocks through sharp changes in foreign exchange reserves.

The case in favour of capital account liberalisation is largely based on efficiency grounds. For instance, it is argued that capital account convertibility reduces domestic financial transaction costs, stimulates innovation and introduces competition in the financial industry both locally and from abroad. Moreover, for countries with limited access to private external finance, it is suggested that an open capital account may facilitate the flow of urgently needed foreign savings, thereby increasing investment and growth. Additionally, liberalisation provides domestic investors with more opportunities to diversify their portfolios and decrease the concentration of exposure to domestic market risks. However, country experiences imply that the perceived benefits work best largely for countries with sound macroeconomic fundamentals, with well-developed financial markets, effective regulatory and prudential structures and with exchange rate policy that allows adequate flexibility.

Macroeconomic management following capital account liberalisation in most developing countries lacks effectiveness because of the limited range and potency of available instruments. Financial institutions are exposed to more risks and hence there is a need for stronger regulation and supervision and most importantly, the private sector needs to develop appropriate instruments to manage the increasing risks in an open economy. The attainment of such sound macroeconomic systems, including strengthening the financial system through adequate prudential regulations, is a process that develops over time.

Thus, many developing countries, in various stages of development, often impose controls on capital account transactions in an effort to shield themselves from costs associated with fluctuations in international capital flows.

Mathieson and Rojas-Suarez (1993) cite a number of grounds on which countries justify the use of capital controls. These include, among others, management of balance of payments crises or unstable exchange rates generated by excessively volatile short-run capital flows, limiting foreign ownership, of domestic factors of production, maintaining the authorities ability to tax domestic financial activities, income and wealth, ensuring that domestic savings are used to finance domestic investment, and preventing capital flows from disrupting stabilisation and structural reform programmes. However, in the Caribbean, capital controls have been largely used to retain domestic savings to finance domestic investment, support a fixed exchange rate system by ensuring the availability of adequate reserves to meet normal balance of payments transactions and insulate the domestic economy from external shocks.

The general hypothesis that appears to be emerging from the literature suggests that, on average, not enough savings are generated domestically so foreign savings play a major role in closing the savings-investment gaps. Many analysts have argued that opening the capital account usually leads to inflows of foreign capital that, in turn, should cause noticeable jumps in the investment-gross domestic product (GDP) ratios. What is the evidence in the Caribbean?

As is the case with many developing economies in other regions, the countries in the Caribbean have also had to contend with challenges arising from periodic bouts of internal and external imbalances, some of which could be traced to external shocks arising largely from the energy crisis of the 1970s and the effects of the associated measures that were put in place to deal with these shocks. Standard demand management policies along with varying degrees of stabilisation and structural reforms were adopted as countries sought to adjust their economies to deal with these shocks. As small open, mostly fixed exchange rate regimes that depend heavily on international trade, measures to address balance of payments imbalances featured prominently in these adjustment efforts. More often than not restrictions were imposed on external current and capital transactions in the pre-1990 period.

Since the beginning of the 1990s, Guyana, Jamaica and Trinidad and Tobago have liberalised their economies, removing exchange controls and opening up their capital accounts. With the experience of between 12 to 15 years, there should be enough evidence to support or reject the view that capital account liberalisation facilitates significantly a discernable increase in private capital inflows.

Figure 5.1 shows the trends in the gross investment, gross domestic and national savings to GDP ratios for Barbados, Trinidad and Tobago, Jamaica

and Guyana since 1960. The data seem to suggest that the latter (floating exchange rate) countries have experienced increased investment ratios since opening up their capital accounts, although Guyana's investment has tapered off since 1998. Over the same period, the investment ratios in Barbados, which still maintains some controls on capital and financial transactions, have been sluggish and have indeed fallen from the pre-1990 levels. To what extent can one attribute the increased investment ratios in the three liberalised economies to the liberalisation of the capital account, given that it generally formed part of a menu of reforms in the countries concerned?

Figure 5.1:

Trends in Investment and Savings to GDP Ratios

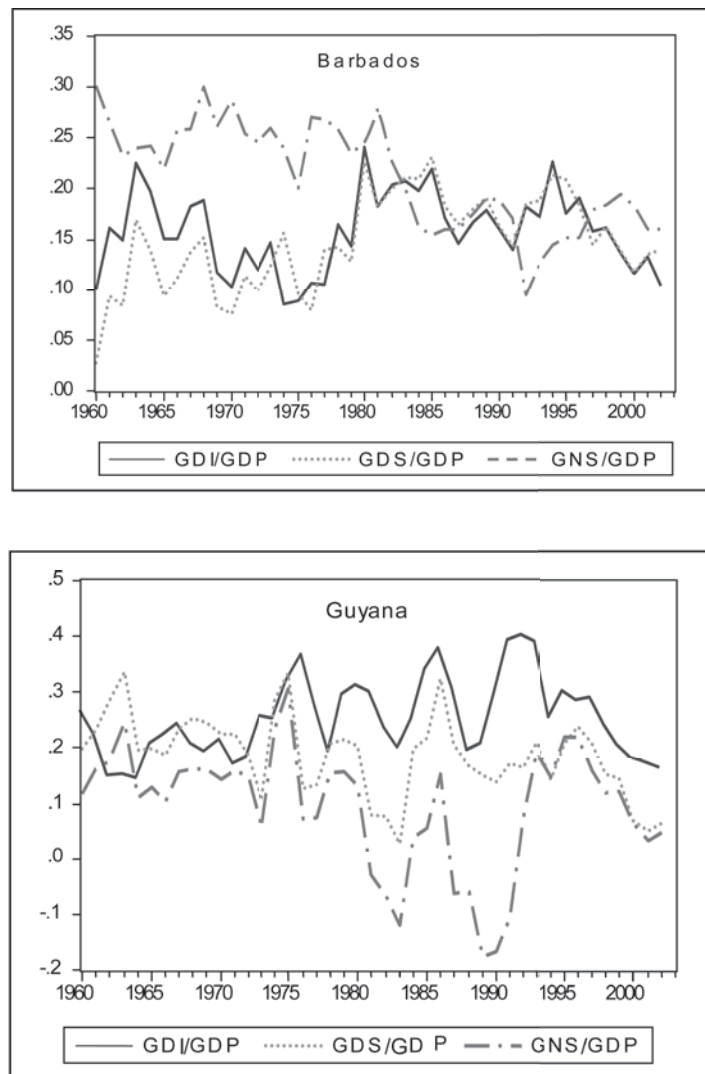
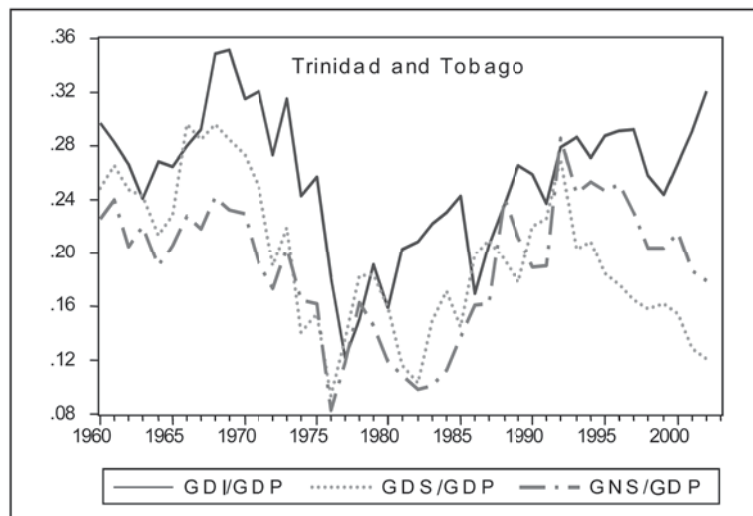
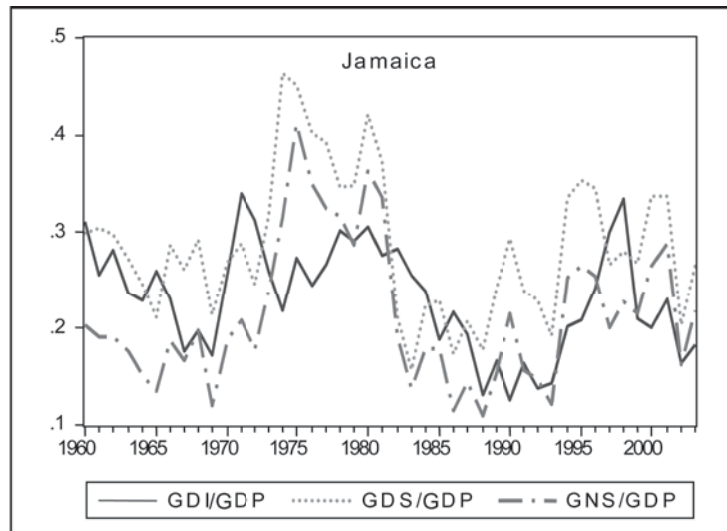


Figure 5.2(Cont'd):

Trends in Investment and Savings to GDP Ratios



The objectives of this paper are two-fold: to examine the macroeconomic impact of opening up the capital account in certain Caribbean countries and the extent to which such inflows would have translated into increased investment flows. The second objective allows the determination of the possibility of increased foreign savings substituting for domestic savings, as risk-averse domestic savers seek to hold a significant portion of their wealth in foreign assets that may be perceived to yield higher or more certain returns.

After the introduction, the next section looks briefly at the macroeconomic experiences with capital account liberalisation of the countries under analysis. Sections 3 and 4 discuss the theoretical approaches and empirical evidence of capital account liberalisation in private capital inflows. Section 5 outlines the empirical model, econometric methodology and data. The results are presented in Section 6 and the final section concludes.

2. Selected Country Experiences Since Capital Account Liberalisation

During the 1970s and 1980s Caribbean economies, especially Guyana and Jamaica, were characterised by highly restrictive trade and financial regimes: credit was largely directed to priority sectors at preferential interest rates, restrictions on current and capital accounts were extensively used, and market interest rates were administratively set by the authorities. These policies, while well intentioned, insulated the domestic economy, but at the same time were ineffective in a changing global environment. To bring about some measure of efficiency in the allocation and mobilisation of resources, Caribbean economies began the process of liberalising their financial systems as part of an overall package of economic reforms. With trade reforms and a gradual move towards more outward-oriented development strategies in the 1990s, many of the countries in the Caribbean removed restrictions on external current and capital accounts. In particular, this aspect has been the most emphasised component of the financial liberalisation process in the Caribbean, as it is critical to the proper functioning of the Single Market and Economy, which envisages, *inter alia*, the free movement of capital across regional borders.

Guyana, Jamaica and Trinidad and Tobago removed all capital restrictions on both the current and capital accounts during the early 1990s. Jamaica liberalised its foreign exchange market substantially, opting for the simultaneous liberalisation of the current and the capital and financial accounts. The number of dealers increased in 1994 and numerous cambios and merchant banks were established. Guyana opted for a more gradual process, liberalising over a period of five years, starting with current account transactions and then the capital account. The liberalisation process in Trinidad and Tobago occurred over a period of three years. After a period of achieving macroeconomic

stabilisation, the sequence of reforms that followed included trade and tax reform, the dismantling of the regime of exchange controls, followed by the floating of the exchange rate in 1993. In the immediate period after the flotation, the Central Bank, in collaboration with the commercial banks, introduced several measures to engender stability in the foreign exchange market. These measures included a code of conduct for market participants, and a sharing agreement. According to Forde (2003), these arrangements contributed to the stability and the reduction in volatility in the foreign exchange market. In addition, the Central Bank intervenes when necessary in the foreign exchange market to smooth out swings in liquidity and to keep the exchange rate in line with the macroeconomic environment.

Barbados has adopted a more gradualist approach to financial liberalisation and reform, with the liberalisation agenda focussing primarily on removing restrictions to current account transactions, with delegated authority granted to commercial banks to authenticate numerous transactions, except for cash gifts, undocumented merchandise imports, travel and foreign currency accounts. In particular, most capital account transactions with the Organisation of Eastern Caribbean States (OECS) countries are fully liberalised, with the exception of transactions in real estate and government securities which tend to be very large and could lead to volatility in the financial market. Indeed, Barbados' fixed exchange rate regime underscores a more cautious approach with respect to capital account liberalisation, on account of the inextricable link between the maintenance of sufficient foreign reserves and the preservation of the fixed exchange rate. A major concern is that opening up even within the Caribbean Community (CARICOM) could be tantamount to opening up to the rest of the world, since countries like Jamaica, Trinidad and Tobago and Guyana, which have fully liberalised regimes, could act as conduits for capital outflows to the rest of the world. The liberalisation process was boosted during the period 2000-01 with government borrowings of \$300 million, specifically to buttress the foreign reserves against the adverse effects from the liberalisation of trade and the expected liberalisation of exchange controls. The liberalisation initiatives that followed included increased delegated authority to commercial banks for current account transactions, permission for pension funds to expand their investments abroad and the gradual liberalisation of the regime for foreign currency accounts. For a detailed analysis of the liberalisation process in the Caribbean, see Greenidge (2006) and Chapter 1 of this book.

Table 5.1 presents average comparative macroeconomic and balance of payments indicators for the countries under analysis since the mid-1980s. With the exception of Barbados, all the countries were more liberal in the second period and this period was associated with higher capital and financial inflows. Indeed, the impact of increased capital and financial inflows on economic

performance was mixed. In the case of Trinidad and Tobago, this era saw an expansion in domestic investment, a rebound in economic growth, lower inflation and a significant enhancement of the public finances. In addition, there was general strengthening in the balance of payments accounts: the external current account balance improved considerably and there were large inflows of capital, particularly direct investment. In the latter period, this category almost doubled to US\$812.8 million, mostly for investment in the petroleum sector. In Jamaica and Guyana the stories are different.

Table 5.1:
Averages of Selected Macroeconomic and Balance of Payments Indicators

Selected Macroeconomic Indicators	Barbados			Trinidad and Tobago			Jamaica			Guyana		
	1985-90	1991-00	2001-04	1985-90	1991-00	2001-02	1985-90	1991-00	2001-03	1985-90	1991-00	2001-04
Real GDP Growth	2.1	1.3	1.2	-2.2	4.6	7.7	3.4	1.4	1.6	3.6	5.0	1.1
Inflation	3.8	2.8	1.4	9.4	6.0	4.3	15.3	26.0	9.5 ¹	n.a.	6.9 ²	4.7
Investment to GDP	0.17	0.16	0.16	0.17	0.21	0.19	0.23	0.27	0.29	0.30	0.31	0.18 ³
Domestic Savings to GDP	0.19	0.17	0.14	0.22	0.30	0.27	0.19	0.19	0.11	0.20	0.17	0.06 ³
Fiscal Balance to GDP	-5.8	-1.6	-3.7	-4.6	-0.1	0.2	-0.9	1.6	-5.7	n.a.	-4.2 ²	-5.2
Balance of Payments (US Millions)												
Current Account	16.3	2.2	-196.2	-59.0	18.2	246.2	-160.84	-192.5	-864.8	n.a.	-112.7 ⁴	-111.8 ⁵
Capital and Financial Account	41.1	47.3	239.9	-173.3	83.2	359.4	162.8	307.9	946.6	n.a.	97.2 ⁴	113.6 ⁵
Of which:												
Direct Investment	5.2	13.6	20.5	56.8	495.0	812.8	37.1	228.8	605.2	n.a.	74.0 ⁴	41.9 ⁵
Portfolio Investment	3.5	0.3	0.4	0.0	-27.3	-138.2	0.0	2.8	348.4	n.a.	2.8 ⁴	3.2 ⁵
Other Investment	13.8	51.9	89.9	-230.2	-411.9	-467.2	145.2	188.2	827.5	n.a.	-19.3 ⁴	-21.3 ⁵

Sources: The International Financial Statistics CD Rom, International Monetary Fund, Various issues of the Annual Statistical Digest, Central Bank of Barbados.

Notes: Data for the period 2001-04, ² data for the period 1995-2000, ³ data for the period 2001-02, ⁴ data for the period 1992-2000, ⁵ data for the period 2001-03, n.a means not available.

Despite a substantial increase in direct investment during the 1990s, Jamaica appeared to be negatively affected by the liberalisation process, as real output growth declined and inflation almost doubled. However, there was a steady rise in domestic investment.

With regard to Guyana, the evidence points to external current account deficits, worsening fiscal balances and a falloff in the average rate of domestic investment and real economic growth. In Barbados, the undertaking of a more liberal trading arrangement resulted in persistent current account deficits, since the late 1990s, which is clearly evident in the latter period. The inflows of private capital during this period were primarily for investment in tourism and utility production, while the Government received inflows from privatisation and borrowings on the international capital market. More recently, cross-border portfolio investment in CARICOM has increased significantly and this has challenged reserve accumulation. In addition, the average rate of expansion in domestic investment and economic growth slowed.

3. Theoretical Approaches to the Determination of Private Capital Flows

According to Johnston and Ryan (1994), there are two main theoretical approaches to explaining private capital flows: the portfolio balance approach, based on Branson's (1968) extension of the Markowitz-Tobin portfolio selection model, and the monetary approach to the balance of payments, following Johnson (1971) and Kouri and Porter (1974). The former focuses on the role of risk-adjusted returns; that is, the relative real returns on domestic and foreign assets, as well as the change in wealth. The latter relies on the role of monetary disequilibrium in explaining capital movements; that is, the difference between the demand for money and the money supply in the domestic market. As a result, variables that determine the demand for money and the supply of money become relevant to influencing capital flows.

Fernandez-Arias and Montiel (1994) develop a useful analytical framework that brings together aspects of these two types of approaches. They decompose the influence on private capital flows into domestic and external factors. Suppose capital flows occur in the form of transactions in various types of assets, indexed by s , where $s = 1(s)n$. The domestic returns on asset s is decomposed into a "project" expected returns D , and a "country creditworthiness" adjustment factor, C , which lies between zero and one. D depends inversely on the vector F of net flows to projects of all types, while C is a negative function of the end-of-period stocks of liabilities of all types, denoted $S(=S_{-1}+F)$. Voluntary capital flows (components of the vector F) are determined by the arbitrage condition:

$$D_s[d,F]C_s[c,S_{-1}+F]=W_s[w,S_{-1w}+F] \quad (5.1)$$

where W_s is the opportunity cost of funds of type s in the world economy, taken to depend on S to reflect portfolio considerations for external creditors. The shift factors d , c and w are associated with the domestic economic climate, country creditworthiness, and any creditor country financial conditions relevant for developing country investment (for example, financial returns and capital-market regulations). Specifically, d would include, among other things, any variable that increases the expected rate of return and/or reduces the perceived risk as in the portfolio balance approach mentioned above. In addition, it would capture the removal of capital controls and liberalisation of restrictions on foreign direct investment. c would depend on some current measure of available resources like wealth in the portfolio balance approach as well on foreign returns. Finally, w would include factors like foreign interest rates and/or recession abroad.

Equation (5.1) defines F implicitly; hence, capital flows will be determined by d , c , w and S_{-1} , that is, by domestic factors operating both at the project and country levels, as well as factors pertaining to the external environment. The component vector F , capital flows, is assumed to be increasing in d and c , but decreasing in w and S_{-1} .

4. A Review of the Empirical Evidence of Capital Account Liberalisation (Controls) on Private Capital Flows

The macroeconometric literature on the impact of capital account liberalisation has focused on economic growth with mixed results (for excellent surveys of this literature, see Eichengreen (2001); Edison, *et al.*, (2002) or Prasad, *et al.*, (2003)). Also, a number of studies have drawn conclusions about capital mobility from examining economic variables, like domestic interest rates or saving and investment (see Frankel, 1989). However, the literature on the direct impact of capital controls on private capital flows has been scant.

The first study that has empirically examined directly the effect of capital controls on private capital flows is Johnston and Ryan (1994). Using panel data from 52 developed and developing countries for the period 1985-1992, they found that exchange controls significantly alter the structure of industrial countries' capital accounts, especially by restricting outflows of recorded direct and portfolio investment. However, for developing countries capital controls do not effectively prevent the outflows and mis-invoicing may be used to circumvent the exchange control.

Since this panel data study, time series investigations have been done on countries in Latin America, Asia as well as Europe. Soto (1997) and De Gregorio,

et al. (2000), using the Vector Autoregression (VAR) approach on monthly data to analyse Chile's unremunerated reserves requirement on capital flows, found that the composition of private capital flows tilted towards long-term maturities, with the tax on capital movements discouraging short-term flows.

Valdes-Prieto and Soto (1998), employing a different methodology, a non-linear specification, reached a similar conclusion that capital controls depressed short-term flows in Chile. Overall, these studies on Chile suggested that the reduction in short-term flows was fully compensated by increases in long-term capital flows, resulting in aggregate capital moving into Chile being unaltered by the controls.

In the case of Colombia, Cardenas and Barrera (1997) also found a relative inability of controls to reduce the level of capital, and non-remunerated deposits success in inducing a re-composition of foreign liabilities in favour of long-term maturities. Reinhart and Smith (1996) results for a group of Asian, Eastern European and Latin American countries are consistent with the proceeding findings. On the other hand, Buch and Hanschel (1999) assessed the un-remunerated reserve requirement in Slovenia for the period 1992 to 1998 and found that the unremunerated reserve requirement was ineffective in reducing overall inflow of foreign capital.

Cardoso and Goldfajn (1998) studied the case of Brazil, by accounting for the endogeneity of capital controls (both on outflows and inflows) by considering a government that set controls in response to capital inflows. They found that the government reacts strongly to capital flows by increasing controls on inflows during booms and relaxing them during times of distress. Using a VAR framework, they also showed that controls temporarily alter the level and composition of capital flows within a six-month period, but have no sustained effects in the long run.

Utilising a similar VAR approach to Cardoso and Goldfajn (1998), Goh (2005) found similar results for Malaysia; that is, control policies that had temporary effects on capital flows and controls that have reduced short-term flows but to some extent may have decreased private long-term flows, namely, foreign direct investment.

5. Empirical Model, Methodology and Data

Empirical Model

The model used in this study is very similar to that developed by Johnston and Ryan (1994) and is utilised because it is one of the few empirical models that allows for a direct impact of capital liberalisation on private capital flows. It is defined as follows:

$$C = \alpha_0 + \alpha_1 Y + \alpha_2 GB + \alpha_3 (i - i^*) + \alpha_4 c + \alpha_5 REER + \varepsilon \quad (5.2)$$

The dependent variable C is a measure of capital and c is an explanatory variable representing capital account liberalisation. The remaining variables: Y , GB , $(i - i^*)$ and $REER$ are other factors influencing the movement in capital flows. The interest rate spread $(i - i^*)$, the real effective exchange rate ($REER$) and the change in wealth - measured by national income Y - are thought to be largely related to portfolio investment decisions. In addition, the government balance (GB) acts as a measure of confidence to investors and thus it also plays a role in determining capital inflows. *A priori*, it is anticipated that $\alpha_1, \alpha_3, \alpha_4 > 0$; $\alpha_2, \alpha_5 < 0$. The error ε satisfies the classical least squares regression properties.

Methodology

Three tests, (Augmented, Dickey Fuller, Phillips - Perron and Kwiatkowski, *et al.*) were conducted on the variables in order to ascertain their stationary properties. The results¹ suggest that all the variables can be considered as following $I(1)$ processes with the exception of the government balance variable for Barbados. In light of these results and the relatively small sample size of this study, the Stock and Watson (1993) dynamic OLS (DOLS) approach to co-integration is used to derive estimates for the short and long run. As discussed in the earlier chapters of this book, this method improves on normal OLS and maximum likelihood procedures by (1) coping with small sample and dynamic bias and (2) by avoiding the problems encountered when using full information techniques similar to that developed by Johansen (1988) such as parameter estimates that can be adversely affected by mis-specification in other equations. Additionally, the technique takes care of other issues such as endogeneity and serial correlation by including leads and lags of the first differences of the $I(1)$ regressors.

Data

The model is estimated using annual data for Barbados, Guyana, Jamaica and Trinidad and Tobago for the period 1979 to 2003. The capital flow variable (C) is represented by private capital inflows and it is estimated by summing net private liabilities of portfolio investments, direct investments, commercial bank investments and other investments. The capital account liberalisation is taken from Chapter 2 of this book (see also Greenidge, 2006). The interest rate spread $(i - i^*)$ is derived by subtracting the Barbadian treasury bill rate from the United States (U.S) treasury bill rate. The $REER$ for Barbados and Jamaica was sourced from Moore *et al.* (2003), and is defined as a consumer price index of a country's main trading partners relative to that of the domestic currency.

¹ These are available from the authors upon request.

Data for the government or fiscal balance (GB), real GDP (Y), the REER for Guyana and Trinidad and Tobago, and the treasury bill discount rates, were taken from the International Monetary Fund (IMF)'s International Financial Statistics, March 2006 CD ROM. In some cases information for Y, i and GB were also gathered from the Barbados Annual Statistical Digest, the Central Bank of Guyana Statistical Bulletin as well as the Central Bank of Guyana Annual Report. Most of the data for the GB of Trinidad and Tobago was obtained from their Central Bank's website. The PcGive econometric software and Eviews version 6.1 are used to compute the empirical results.

6. Results

The results are presented in Table 5.2. The long-run results are in the top panel, while the parsimonious error-correction models are shown in the lower panel. For each country the coefficient on the error-correcting term is negative and significant indicating that the private capital inflows variable forms an equilibrium relationship with the other explanatory variables in the respective models. Moreover, deviations from this relationship are partially corrected each year at speeds ranging from a slow 16 percent in the case of Trinidad and Tobago to a rapid 93 percent in the case of Guyana.

Finally, the signs on the control variables are in line with prior expectations with the exception of the government balance in the cases of Barbados and Jamaica. For these two countries the coefficient on government balance is positive, indicating that increases in the fiscal balance encourage private capital inflows. This would suggest that government operations are carried out in a manner that stimulates private sector activity and, thus, raises the demand for private capital inflows. Such an explanation is consistent with recent trends in Barbados where Government formulates various public-private partnership arrangements for provision of goods and services: the private firm designs, constructs, finances, operates and maintains the infrastructure, while the public sector pays for the services. However, this explanation, in terms of complementarity between the government balance and private investment, may not hold for Jamaica. Government capital spending in Jamaica has been extremely low during the period under consideration and changes in the government balance are largely related to debt service. Thus, it appears that the majority of capital inflows have been into government paper because the returns there were so high that additional investment in real activity could not compete.

Table 5.2:

Estimates for Private Capital Flows

<i>Long-run Elasticities</i>	Barbados	Guyana	Jamaica	Trinidad
Real GDP	2.770** (0.998)	3.260*** (0.327)	0.632*** (0.049)	0.239*** (0.023)
Government Balance	1.132** (0.444)	-0.415*** (0.040)	0.220*** (0.019)	-1.819*** (0.206)
Real Interest Rate Spread	0.380** (0.176)	0.054** (0.014)		
Real Effective Exchange Rate	-	-0.173*** (0.008)	-3.983*** (0.200)	-0.250*** (0.024)
Capital Account Liberalisation	-0.441*** (0.017)	-	0.966*** (0.063)	0.519*** (0.0604)
<i>Parsimonious Error-Correction Model</i>				
ECM _{t-1}	-0.640*** (0.194)	-0.930*** (0.086)	-0.241*** (0.029)	-0.161*** (0.036)
$\Delta L(\text{Real Private Capital Inflows})_{t-1}$			0.514*** (0.075)	-0.183*** (0.051)
$\Delta L(\text{Real GDP})_t$	-		-0.488** (0.192)	-0.120** (0.054)
$\Delta L(\text{Real GDP})_{t-1}$	-	2.487** (1.033)	0.613*** (0.128)	0.144** (0.059)
$\Delta L(\text{Government Balance})_t$	0.799** (0.360)	-0.391*** (0.109)		0.078* (0.044)
$\Delta L(\text{Real Interest Rate Spread})_t$	0.301*** (0.065)	0.066** (0.022)		-0.253** (0.089)
$\Delta L(\text{Real Interest Rate Spread})_{t-1}$	-	0.069 (0.042)	0.001* (0.0008)	-0.192** (0.063)
$\Delta L(\text{Capital Account Liberalisation})_t$	-6.808*** (1.413)	-1.407** (0.632)	0.923*** (0.009)	
$\Delta L(\text{Capital Account Liberalisation})_{t-1}$			-0.542*** (0.064)	0.568** (0.268)
$\Delta L(\text{Real Effective Exchange Rate})_t$	-	0.318*** (0.048)		
$\Delta L(\text{Real Effective Exchange Rate})_{t-1}$	-	-0.168*** (0.048)		
Constant	-13.509 (4.137)	-38.84*** (3.439)	11.012*** (1.300)	

Table 5.2 (Cont'd):

Estimates for Private Capital Flows

Dummy		0.613*** (0.146) 2000		3.281*** (0.150) 1997
R^2	0.65	0.92	0.97	0.94
DW	2.14	1.9	1.74	2.05
AR	0.754[0.486]	0.040[0.845]	2.223[0.147]	0.029[0.869]
RESET	0.408[0.531]	0.437[0.513]	0.710[0.414]	2.166[0.172]
Norm	0.413[0.814]	0.107[0.950]	2.361[0.307]	1.727[0.422]
ARCH	0.287[0.600]	0.908[0.366]	0.105[0.751]	0.162[0.697]
HET	0.327[0.935]	0.462[0.908]	0.000[1.00]	0.361[0.943]

Notes: Heteroscedasticity and autocorrelation consistent standard errors are in parentheses. *, **, *** indicates significance at the 10, 5 and 1 percent levels, respectively. The F-statistic for the respective diagnostics tests are shown (unless indicated otherwise) and the associated p-value in square brackets. DW is the Durbin-Watson statistic. AR is the Lagrange multiplier test for p -th order residual autocorrelation correlation (see Godfrey, 1978). RESET is the Ramsey's (1969) RESET test for incorrect functional form using the square of the fitted values (χ^2 (1)). Norm is the test for normality of the residuals based on the Jarque-Bera statistic (χ^2 (2)). ARCH is the autoregressive conditional heteroscedasticity test for up to p -th order (see Engle, 1982). HET is the unconditional heteroscedasticity test based on the regression of squared residuals on squared fitted values (See Koenker, 1981). Finally, note that the final parsimonious model from which the long-run estimates are derived is available from the authors.

The results for capital account liberalisation vary somewhat across the countries. In Barbados, it appears that capital account liberalisation led to a reduction in net private capital inflows in both the short and long run. The findings for Guyana also point to a negative short-run impact but suggest that this faded with time. On the other hand, the results for Jamaica and Trinidad and Tobago indicate that in both cases the opening up of the capital account led to increased inflows of private capital in both the short and long run. However, the dynamics of the flows are slightly different for the two countries. In Jamaica, initially the inflows over-shot their long-run equilibrium level and then declined towards it (this is shown by the signs on the current and lagged changes in capital account liberalisation), while in Trinidad and Tobago there was no significant change in inflows immediately following the opening of the capital account but by the second period the impact was positive and significant.

7. Do Increased Capital Inflows lead to Investment Booms?

The next hypothesis to be tested is whether private capital flows complement or substitute for private investment, that is, do private capital flows lead to investment booms. To examine this issue a modification of

the investment model derived by Acosta and Loza (2004) is used because, as discussed in Greenidge (2006), it includes most of the variables thought to significantly influence private investment in Caribbean countries. The model is defined as follows:

$$privinv_t = c + a_1 extdebt_t + a_2 credit_t + a_3 gdp_t + a_4 privcap_t + \mu_t \quad (5.3)$$

where *privinv* is private investment, *extdebt* is external debt, *credit* is private sector credit, *gdp* is gross domestic product at market prices and *privcap* is private capital inflows. The *a priori* expectations are $a_2, a_3, a_4 > 0$; $a_1 < 0$.

The results are presented in Table 5.3, with the long-run elasticities in the upper panel and the parsimonious error-correction models in the lower panel. The error-correcting terms are each negative and significant implying that in each country private investment and the surviving explanatory variables form an equilibrium relationship, where the speeds of adjustment to equilibrium range from 34.9 percent in Guyana to 91.3 percent in Jamaica. The results suggest that increases in private capital inflows have led to higher investment in both the short and long run in Barbados, Guyana and Trinidad and Tobago. However, the reverse appears to have occurred in Jamaica where greater private capital inflows are associated with a decline in private investment. The Jamaica result may reflect the fact that most inflows have been for government paper. In addition, a relative large amount of inflows have tended to be speculative in nature as Jamaicans living abroad attempt to take advantage of arbitrage opportunities created by the large interest differentials between the Jamaican and foreign interest rates.

Another possible reason may be the very high levels of crime in that country, in that quite often a significant proportion of inflows often goes to provide security for investment projects and to replace investment that has been destroyed by crime².

8. Conclusion

This paper examines the impact of capital account liberalisation on private capital inflows in the Caribbean, using data for Barbados, Guyana, Jamaica and Trinidad and Tobago. It also investigates the extent to which these inflows have translated into increased private sector investment.

² The World Bank (2003) discusses extensively the negative effects that crime in Jamaica has had on investment and on the wider economy at large.

Table 5. 3:

Estimates for Private Investment

<i>Long-run Elasticities</i>	Barbados	Guyana	Jamaica	Trinidad
Real External Debt	-0.197*** (0.059)	5.639*** (0.835)		-1.007*** (0.139)
Real Private Sector Credit	-	-	0.197** (0.095)	
Real GDP	0.905*** (0.044)	0.216*** (0.038)	0.207*** (0.018)	1.155*** (0.280)
Real Private Capital Inflows	0.076*** (0.016)	0.862** (0.277)	-0.172*** (0.045)	0.435*** (0.056)
<i>Parsimonious Error-Correction Model</i>				
ECM _{t-1}	-0.897*** (0.139)	-0.349** (0.135)	-0.913*** (0.147)	-0.909*** (0.267)
$\Delta L(\text{Real Private Investment})_{t-1}$	-0.408* (0.244)	0.519*** (0.121)		-0.278** (0.122)
$\Delta L(\text{Real External Debt})_t$	-0.283* (0.166)	1.318 (0.776)		0.484*** (0.158)
$\Delta L(\text{Real External Debt})_{t-1}$	0.840** (0.369)	-1.175 (0.828)		-0.925*** (0.199)
$\Delta L(\text{Real Private Sector Credit})_t$				-1.036** (0.541)
$\Delta L(\text{Real Private Sector Credit})_{t-1}$	0.840** (0.369)	-0.933*** (0.398)	0.238*** (0.057)	
$\Delta L(\text{Real Private Capital Inflows})_t$	0.064*** (0.014)	0.459* (0.204)	-0.214*** (0.063)	0.279*** (0.046)
$\Delta L(\text{Real Private Capital Inflows})_{t-1}$	0.019* (0.011)			
$\Delta L(\text{Real GDP})_t$		0.579*** (0.078)	0.351*** (0.095)	
$\Delta L(\text{Real GDP})_{t-1}$		-0.421* (0.244)	0.251*** (0.074)	1.895** (0.839)

Table 5.3 (Cont'd):

Estimates for Private Investment

Dummy	-0.498*** (0.089) 1993/93			
R^2	0.82	0.77	0.80	0.74
DW	1.41	2.16	2.57	1.66
AR	0.330[0.725]	0.696[0.521]	3.449[0.093]	1.096[0.365]
RESET	4.262[0.057]	0.677[0.428]	0.251[0.623]	0.695[0.420]
Norm	0.552[0.759]	3.386[0.184]	1.441[0.487]	0.411[0.814]
ARCH	0.025[0.876]	0.083[0.779]	1.466[0.244]	0.158[0.698]
HET	0.137[0.993]	0.462[0.908]	0.513[0.837]	0.361[0.943]

Notes: Same as Table 5.2

The stylised facts on these Caribbean countries suggest an upward shift in capital flows after capital liberalisation and a consequent rise in investment levels. However, rigorous econometric analysis only supported this hypothesis in the cases of Jamaica and Trinidad and Tobago where, after controlling for other influences on private capital inflows, the results indicate that capital account liberalisation led to increased inflows of private capital in both the short and long run. However, the findings for Barbados and Guyana point to a negative relationship between capital account liberalisation and private capital inflows, which most likely reflects increased outflows following the easing of capital account restrictions.

With respect to the second hypothesis, the evidence supports the notion that private capital flows complement private investment in Barbados, Guyana and Trinidad and Tobago but not in the case of Jamaica. In this regard, it is argued that the negative effects in Jamaica may reflect the fact that a significant proportion of inflows is for speculative purposes and the alarmingly high levels of crime in that country (no measure of crime is included in the empirical model presented here and thus this can not be confirmed and remains an area for future research).

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