The Nature and Measurement of Financial Liberalisation: An Application to the Caribbean

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Abstract

Over the last two to three decades, many countries have implemented policies to transform their financial systems from that of heavy state involvement and controls to greater private ownership, fewer restrictions and better prudential oversight. Caribbean countries have also followed this trend and have adopted policies aimed at liberalising their financial systems, mostly as part of their economic stabilisation and structural adjustment programmes. More recently, efforts at creating a Caribbean Community (CARICOM) Single Market and Economy have led the governments of the member countries to step-up their liberalisation process. This increased trend towards financial liberalisation has made it extremely important to be able to quantify these efforts in assessing the degree of liberalisation achieved thus far. This paper reports on the construction of a comprehensive set of measures for the region, including indices of both external and domestic liberalisation. The measures employed assess the various policies regulating inward and outward financial transactions and the operations of domestic financial institutions. In doing so, they allow for the comparison of the forms and intensity of those regulations across countries and over time. The indices appear to be consistent with the stylised facts on and the nature and processes of financial liberalisation in the region.

JEL Classification: C82, F32, F33, F36, G28

Key words: financial liberalisation, capital controls, sequencing

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1. Introduction

Over the last two decades, the effects of financial liberalisation have been heavily debated and researched. During this period many countries have implemented polices to transform their financial systems from that of heavy state involvement and controls to greater private ownership, fewer restrictions and better prudential oversight. Early advocates of financial liberalisation, such as McKinnon (1973) and Shaw (1973), argue that liberalisation leads to greater efficiency in the allocation of resources and promotes productive investment and hence economic growth. Within the Caribbean region, financial liberalisation has been an important component of the developing CARICOM Single Market and Economy (CSME). Protocol II – Right of Establishment, Provision of Services and Movement of Capital envisages the creation of the Single Market by adding to the free movement of goods, the free movement of services, the unrestricted free movement of capital, the free movement of selected categories of skills and the right of CARICOM nationals to set up business in any CARICOM country.

This paper attempts to quantify the financial liberalisation efforts for some of the countries in the region. The task at hand is far from simple. In fact, as noted by Kaminsky and Schmukler (2003), in spite of the proliferation of research on financial liberalisation, information on the evolution of the financial regulations is very fragmented and measures of the actual liberalisation process are even more disjointed This is especially so for Caribbean countries.[1] In fact, we only found one index, Quinn's (1997) measures of international financial liberalisation,[2] which includes Caribbean countries and then only for the years 1982 and 1988. As a result there is a dearth of research on the effects of financial liberalisation in the region. The few studies that have been done tend to either concentrate on descriptive analyses of the liberalisation process (as with Peart, 1995; El-Hadj, 1997) or use proxies to reflect it (for example, Williams, 1996; Howard, 2001). This paper provides therefore a much more extensive and up-to-date set of measures of financial liberalisation for the Caribbean.

[1] This is not because the topic of financial liberalisation has less importance in the region but often because of a lack of consistent data.

[2] In principle financial liberalisation can be parcelled into two measures: international or external financial liberalisation, which is the opening of the domestic financial system to the free flow of international finance; and domestic financial liberalisation, which is the removal of restrictions on the functioning of domestic banks and other financial institutions.

2. Understanding the Concept of Financial Liberalisation

The concept of financial liberalisation can be traced as far back as Bagehot (1873), who argues that the financial system plays a critical role in the adoption of better technologies that effectively mobilise resources, thus encouraging economic growth. However, the concept really gained prominence following the seminal works of McKinnon (1973) and Shaw (1973), in which they argue that "financial repression" is a major impediment to or a drag on economic growth in developing countries. They define financial repression as the set of government legal restrictions imposed on the activities of financial intermediaries, preventing them from functioning at their full capacity level. These restrictions are essentially taxes on the financial system and usually consist of one or a combination of the following. The banking system may be forced to hold a proportion of its assets in the form of government debt through the imposition of high reserve and statutory ratios. There may be quantitative controls and selective credit allocation in order to force lending to sectors that government deems a priority. There may be state ownership of part of the banking system. Finally, there may be interest rate ceilings to prevent competition with public sector fund raising from the private sector and to encourage low-cost investment.

The development literature argues that the main rationale for financially repressive policies is the government's inability to raise taxes through conventional means, either because of political constraints or administrative inefficiencies (Agénor, 2000). In most developing countries the tax base is narrow and inadequate which, combined with government's limited ability to collect taxes, leads to high tax rates and a heavy reliance on direct taxation and monetary financing. This is further aggravated where capital markets are insufficiently developed to provide government with an investors' base for its debt instruments. Thus, by directing banks to lend to areas they might otherwise not even consider, and instructing them to hold high reserves and liquidity ratios, government manipulates the financial system for its development goals and at the same time creates a captive market for its debt instruments.

In a sample of 24 developing countries, Giovannini and De Melo (1993) estimate that over the period 1972-87 government revenues obtained from financial repression (proxied as the difference between foreign and domestic interest rates multiplied by the stock of domestic government liabilities) as a share of GDP ranged from 0 in Indonesia to 6 percent in Mexico and Zimbabwe. They stress that governments in developing countries have been able to extract such revenues via artificially low interest rates. Overall, their findings suggest that the revenue from financial repression can be quite substantial and thus financial liberalisation would generate a sizeable budgetary problem unless accompanied by appropriate fiscal

measures to substitute for the revenue loss. Similar results are reported by Fry *et al.* (1996) and Easterly and Schmidt-Hebbel (1994) for other developing countries.

The liberalisation thesis contends that these restrictions induce significant economic distortions and as such financial systems remain under-developed, while lending patterns are inefficient and often fail to achieve their distributional goals. Furthermore, in the presence of high inflation, real interest rates often become negative, resulting in low saving and capital flight. This in turn leads to reduced investment and growth. Both McKinnon and Shaw maintain that financial liberalisation, involving the establishment of higher interest rates that equate the demand for and supply of saving, in addition to the removal of credit controls, will lead to increased saving, foster a more efficient allocation of investment and contribute positively to economic growth. If the ceiling on interest rates is raised but not completely removed (it is still below the equilibrium rate, hence there is only a partial liberalisation), the real interest rate rises towards its market clearing level and encourages saving and, although credit rationing still exists, the efficiency of investment increases as more projects with higher returns can now be financed. Only when interest rates are fully liberalised will credit rationing disappear (banks can now finance projects that offer the best combination of risk and return, rather than being induced to lend to the safest borrowers almost regardless of the expected rate of return), economic growth increases as saving and investment approach their equilibrium levels.

Three decades have passed since the formulation of the M-S hypothesis, and the concept of financial liberalisation has evolved to encompass more than the removal of credit controls and the "freeing-up" of interest rates. It is now seen as a part of a broader policy framework on financial sector reform. Indeed, under the auspices of the IMF and other international institutions, financial liberalisation has been a key component of economic policy reforms implemented in developing countries. This is further encouraged by the view that there are additional benefits to financial liberalisation beyond the original M-S framework. For example, many authors (including Goldberg and Saunders, 1981; Walter and Gray, 1983; Levine, 1996; Claessens *et al.*, 2001; Bonaccorsi di Patti and Hardy, 2005) argue that increasing foreign competition, by allowing foreign institutions and financial services to enter the domestic market, raises efficiency levels in the local markets, reduces the cost of capital to local firms and leads to a more developed domestic financial sector. In fact, the mere presence of foreign banks should in itself improve the range and quality of financial services available, enable the transfer and practice of modern banking technologies, and enhance local access to international capital. In addition, by allowing domestic firms access to foreign financial markets, the cost of capital is also reduced and this encourages investment

(Bekaert and Harvey, 2000). Others claim that the internationalisation of markets helps to discipline policy makers, who might be tempted to exploit an otherwise captive domestic capital market (Stulz, 1999; Mishkin, 2001).

In their attempt to summarise the literature on financial liberalisation, Williamson and Mahar (1998) identify six dimensions of financial liberalisation: the elimination of credit controls; the deregulation of interest rates; making banks autonomous (that is, freeing them from ad hoc interference in day-to-day management); private ownership of banks; free entry into the banking sector or, more generally, the financial services industry; and the liberalisation of international capital flows. The last two dimensions are often combined and referred to as international financial liberalisation (*IFL*), while the others are collected under the heading of domestic financial liberalisation (*DFL*).

Financial market imperfections, including asymmetric information, imperfect competition and moral hazard, may of course result in market failures that can only be rectified by government intervention in financial markets (see for example, Stiglitz and Weiss, 1992; Stiglitz, 1994; Caprio *et al.*, 1994a; Caprio *et al.*, 1994b; Arestis *et al.*, 2002). One such intervention is in the form of prudential regulation and supervision. The argument here is that since government is the *outcome-based* insurer of the financial system, either explicitly (deposit insurance) or implicitly (some banks are 'too big to fail'), any financial crisis would have significant adverse fiscal and social repercussions; even more so where the capacity to honour contracts and to assemble information relevant to financial transactions is least advanced. Thus, some form of prudential regulation is necessary to induce banks to invest prudently. Capital requirements deter excessively risky activities as financial institutions are forced to have more of their own capital at risk so that they internalise the inefficiency of gambling. If institutions have enough of their own capital invested, then they will be induced to invest prudently. The measurement of financial liberalisation needs therefore to distinguish between regulations retained for appropriate prudential reasons and other regulations.

3. Possible Approaches to Measuring Financial Liberalisation

Measuring financial liberalisation is not an easy task, primarily given its multifaceted nature. Data are also not readily available on every dimension and even where they are available they may be extremely fragmented. In addition, any effort to produce quantitative measures of financial liberalisation usually involves some degree of subjectivity. Thus, there are very few studies providing a comprehensive indicator of financial liberalisation. In general they tend to concentrate separately on measures to capture either the liberalisation of the

domestic financial sector, or the capital account, or the stock market. Where an overall measure of financial liberalisation is produced, weighting problems arise.

Table A1 (in appendix) depicts the various types of restrictions that may be imposed on the financial system. The first section (Panel A) shows the various restrictions on the free flow of international finance and is subdivided into controls on payments and transfers and controls on capital transactions. The categorisation here is based on the IMF's annual publication, *Exchange Arrangements and Exchange Restrictions (AREAER)*, which contains detailed reports on each member country's exchange arrangements, administration of controls, prescription of currency, regulations on import and import payments, payments for invisibles, exports and export proceeds, proceeds from invisibles, capital account transactions, and gold. The detailed nature and consistent framework of the *AREAER* has resulted in it becoming the primary source for information on capital regulations in empirical analysis. Panel B shows the potential restrictions on the operations of the domestic financial sector.

The dimensions listed there are generally agreed upon in the literature; however, gathering information on regulations in any one dimension is rather difficult as there is no single institution compiling and classifying data in a systematic manner over time and across countries. Thus, most researchers construct their own liberalisation chronology using surveys like that of Williamson and Mahar (1998), Johnston and Sundararajan (1999), and Caprio *et al*. (2001) and also individual country bulletins on laws enacted.

Measures of financial liberalisation can be categorised as being either rules-based, where they are constructed from the legal statutes and laws of the respective country (from sources like the *AREAER*), or outcome-based, where liberalisation is proxied by a variable that is supposed to represent the outcome of the liberalisation process (for example, interest rates or the volume of credit by deposit money banks to the private sector to capture DFL, or actual capital flows as an indicator of capital account openness). These can be further differentiated into those that are 0/1 indicators and those that attempt to measure the intensity of controls in a more continuous manner. Table A1 in the appendix gives a summary of the various measures.

Most work has been directed at constructing rules-based indicators. Outcome-based indicators have had limited use in empirical work on the effects of financial liberalisation; we could not find any growth, saving or investment study that uses the degree of correlation between national investment and saving rates or the interest rate differential as indicators of financial liberalisation, while there are a few (for example, Kraay, 1998) using actual capital

flows to estimate the effects of capital account restrictiveness on growth. It is difficult to determine from their approach how much, if any, of the changes in an outcome indicator can be attributed to a change in a country's liberalisation stance.

With respect to the rules-based measures, there has been an increasing effort to incorporate greater detailed information from these sources in order to produce indicators that more closely represent the liberalisation process, both in terms of dimensionality and the level of intensity. In terms of DFL, Kaminsky and Schmukler (2003), Wyplosz (2002) and Abiad and Mody (2005) are the most ambitious. In each case, the author(s) use available information on the restrictions operating in the respective domestic financial system to construct indices that allow for varying levels of intensity. Abiad and Mody (2005) are particularly comprehensive in the coverage of the dimensions of DFL. We propose, therefore to use a similar approach to Abiad and Mody to produce indicators of DFL for those Caribbean countries for which data are available.

On the issue of IFL, the rules-based indicators of Quinn are the most commonly used and most often cited, as they have the widest coverage, in terms of dimensionality, and also allow for varying levels of intensity. Although Quinn's indicators have been constructed for a number of Caribbean countries, this has only been done for the years 1973, 1982, 1988 and 1997. We intend to follow a similar procedure to Quinn and construct indicators of IFL for as many Caribbean countries as the data will allow. In this regard, we will not only use the detailed reports of the IMF's *AREAER* as in Quinn but, for greater clarity and also to ensure closer alignment with practice, supplement these reports, where possible, with additional information from the respective central banks.

4. Financial Liberalisation in the Caribbean

Following the establishment of the various central banks in the region in the early 1960s and early 1970s a wide range of policy instruments were employed to maintain monetary stability. These included primary and secondary reserve ratios, interest rate controls and moral suasion. Also in keeping with objectives of currency stability, virtually all Caribbean central banks at one point or another have utilised exchange controls as a general policy tool. However, coming into the 1980s these economies, faced with growing balance of payments problems and rising fiscal deficits, were forced to seek ways to improve their domestic financial systems to achieve more efficient mobilisation and allocation of resources.

The process of financial liberalisation in the Caribbean is most evident during the early 1990s, mainly as a result of the countries engaging in IMF stabilisation and structural

adjustment programmes, which were designed to restore economic growth. The adoption of such policies was in an effort to liberalise the domestic financial systems and, in some cases, included the lifting of restrictions on capital flows and the floating of exchange rates.

Credit Controls

All the countries reviewed abolished credit controls during the early 1990s, but have placed greater reliance on reserve requirements, which continue to be an active policy tool today. In this regard, while Guyana, Jamaica and Trinidad and Tobago have abandoned secondary reserve requirements and only maintain the cash reserve requirement, Barbados, Bahamas and the Organisation of Eastern Caribbean States (OECS) have retained both instruments.

Interest Rates

One of the first monetary measures adopted by central banks in the region was the control of interest rates on deposits and this control was subsequently extended to loans. However, the deregulation of interest rates has been a common feature of the liberalisation process as the countries adopted more indirect instruments of monetary policy. Only Barbados and the OECS currently have controls on interest rates in the form of a floor on the deposit rates. These countries view this policy as one that complements their fixed exchange rate regime.

Privatisation

There has been a general trend towards the privatisation of commercial banks in the region. Currently there are very few state-owned banks in the region and it is expected that these will soon be privatised. In Barbados, the Barbados National Bank was partially privatised after 30 years of state control.

Exchange Controls

The area of exchange controls was perhaps the most emphasised dimension of the financial liberalisation programmes undertaken by Caribbean countries in the 1990s. This is because such controls were viewed as a hindrance to the inflow of much-needed capital for economic growth. Also, financial liberalisation is seen as an essential part of the proposed CARICOM Single Market and Economy (CSME). In fact, Protocol II - Right of Establishment, Provision of Services and Movement of Capital - envisages the creation of the Single Market by adding to the free movement of goods, the free movement of services, the unrestricted free movement of capital, the free movement of selected categories of skills and the right of CARICOM nationals to set up business in any CARICOM country. Thus, the signing of Protocol II has encouraged CARICOM countries to speed up the liberalisation process. Guyana, Jamaica and Trinidad and Tobago have removed all restrictions on both the current

and capital accounts, albeit at different paces. While Jamaica fully liberalised both accounts simultaneously, Guyana phased the process over a five-year period, starting with current account transactions and then moving to the capital account. Trinidad and Tobago sequenced the liberalisation efforts over a three-year period. The group of fixed-exchange rate countries, Barbados, The Bahamas and the OECS, have only liberalised current account transactions while choosing to maintain restrictions on the capital account.

Barriers to Entry

Not much has changed in this dimension since the establishment of the various central banks in the late 1960s and early 1970s. The legislation governing the operations of regional central banks (The Central Bank Act) details the necessary criteria for entry to the respective banking system and this is complemented by a Financial Institutions Act. It is not clear whether or not these criteria are restrictive. Nevertheless, there is no documented case, or at least none was uncovered in this search, of an application for a banking licence being refused, although there are several cases of licenses being revoked.

Bank Autonomy (Government regulation of operations)

This has not been an area of concern in the region. From the inception of the various central banks the focus has been on prudential regulation and supervision as opposed to direct involvement in the day-to-day operations of banks. However, in the case of Jamaica there was direct involvement in operations of some banks following the financial crisis of the 1990s as part of the restructuring programme.

The Caribbean countries have made significant progress in the implementation of financial liberalisation programmes over the last fifteen years. All countries have eliminated controls on credit allocation, deregulated interest rates, embarked on a path of privatisation and reduced or abolished exchange controls. However, they have all kept reserve requirements as part of their monetary policy programme. Another interesting feature of the process is that those countries with fixed exchange rate regimes have all maintained significant restrictions on the capital account and have also continued to administer a minimum deposit rate, while those with floating rate regimes have fully liberalised those areas.

5. Measuring International Financial Liberalisation

As discussed earlier, given the comprehensive nature of the Quinn measure and the fact that it appears to capture the relative importance of each financial restriction on capital and current transactions by both residents and non-residents, and conveys changes in the financial regulations of each country, it is our preferred rules-based measure on the degree

of *IFL*. However, a comparison is made with the IMF's summary dummies and other outcome-based measures.

The indices for CARICOM countries are constructed based on the decision rules set out in Table 1 and the format illustrated in Table 2. Table 2 gives a description of the different restrictions and the values assigned to each. In this regard we modify Quinn's coding rules to better reflect practices within the Caricom region; for example Quinn assigns a value of 0 to "surrender of proceeds", here we assign a value of 0.5 since in some cases permission is given to retain proceeds for specific purposes and explicitly included CARICOM. Also, we replace Quinn's "some payments require approval" with "authorised banks are allowed to provide foreign exchange for transactions within certain limits". Table 3 demonstrates the process for constructing the indices using 1991 as an example. Capital Receipts and Payments are measured by "Capital" which is scored on a 0 – 4 scale. Inward and outward current account transactions are scored on a scale 0 – 8 (note that current account transactions include both goods and services, each of which is scored on a scale of 0 – 4). Finally, there is the category of "international agreement" which is scored on a 0 – 2 scale. The resulting 0 – 14 scale gives a measure of IFL.

Table 1: Decision Rules used in coding the IMF text

Values	Descriptions
	Goods and Invisibles Payments and Receipts
X = 0	All receipts and payments are blocked.
X = 0.5	All receipts and payments are necessarily surrendered.
X = 1.0	All receipts and payments require approval from the Central Bank. Receipts and payments heavily taxed.
X = 1.5	Authorised banks are allowed to provide foreign exchange for transactions within a certain limit. Transfers do not require approval but are taxed.
X = 2.0	Transfers are free.
	Capital Payments and Receipts
X = 0	Approvals are rare.
X = 0.5	Surrender of receipts is required.
X = 1.0	Approval is required from the Central Bank or Minister of Finance. Approval is not required but transfers are heavily taxed
X = 1.5	Approval is required but liberally or routinely given. Approval is not required but transfers are taxed.
X = 2.0	Approval is not required and transfers are not taxed.
	International Agreements
X = 0.5	Member of CARICOM Country is a member of a currency zone.
X = 1.0	IMF Article VIII Status

Table 2: An Example for the Construction of the Indices Using 1991 IMF Data

	Capital Payment	Capital Receipts	Payment for imports	Payment for invisibles	Receipts for exports	Receipts for invisibles	Agreement	Score	
								C	IFL
Antigua & Barbuda	2.0	2.0	1.5	1.5	2.0	2.0	2.0	4.0	13.0
Barbados	1.0	1.0	1.5	1.5	0.5	0.5	0.5	2.0	6.5
Belize	1.5	1.5	1.5	2.0	0.5	0.5	1.5	3.0	9.0
Dominica	1.0	1.0	1.5	1.5	0.5	0.5	2.0	2.0	8.0
Grenada	1.0	1.0	1.5	1.5	0.5	0.5	1.0	2.0	7.0
Guyana	1.0	1.0	1.5	2.0	1.0	0.5	1.5	2.0	8.5
Jamaica	2.0	2.0	1.5	2.0	2.0	2.0	1.5	4.0	13.0
St. Kitts & Nevis	1.0	1.5	1.5	1.5	0.5	0.5	2.0	2.5	8.5
St. Lucia	1.0	1.0	1.5	1.5	0.5	0.5	2.0	2.0	8.0
St. Vincent & the Grenadines	1.0	1.5	1.5	2.0	0.5	0.5	2.0	2.5	8.5
Suriname	1.0	1.0	1.5	1.5	0.5	0.5	1.0	2.0	7.0
Trinidad & Tobago	1.0	1.0	1.0	1.5	1.0	0.5	0.5	2.0	6.5

C - Capital Liberalisation
IFL – International Financial Liberalisation

In constructing the indices, one major concern is that the conversion of the qualitative text to a quantitative measure is, in some cases, somewhat subjective. It usually comes from the wording of the text; for example, the export proceeds text for St. Lucia states that, "Proceeds must, in principle, be surrendered". Since our coding rule requires 0.5 if proceeds are surrendered, then St. Lucia gets 0.5 for 'Receipts for exports', but how should this phrase really be interpreted? The phrase "in principle" would seem to suggest that it is not a 'hard and fast' rule and perhaps should be given a higher score than 0.5. Another example is that of "approval required". How does one really determine the severity of controls? "Is approval required" a matter of formality or do these central banks really have control over these transactions? The text for Belize alludes to the fact that approval was given freely for capital transactions; clearly this does not deserve a 1.0, but do we give Capital Receipts and Payments a 1.5 or a 2.0? We settled for 1.5. Where possible we attempt to confirm some of the interpretations by consultation with various market participants.

The IFL indices for twelve CARICOM countries for the period 1979 – 2002 are set out in Table 3. The table highlights capital account liberalisation, *C*, and also gives a total for IFL for each country. In this regard, the construction of these indices would be fruitless if they did

not reflect the actual or observed financial liberalisation processes in the region. Hence, a check is made to see if movements in the indices were consistent with observed changes in financial liberalisation in some of the CARICOM countries.

In their working paper, "Measuring Financial Development in Barbados: 1978 – 1998", Bynoe-Mayers and Craigwell (2002) create a financial index for Barbados, which shows that Barbados was minimally liberalised until 1993. They note that the Central Bank of Barbados really begun to liberalise exchange controls in 1994. This is consistent with the indices presented in Table 4, as the *IFL* index for Barbados moved from 6.5 in 1993 to 7.5 in 1994. Doyle (1997) claims that there are many implicit and explicit hindrances to free capital movement. For example, Central Bank approval is required for residents borrowing large sums aboard or by non-residents borrowing in Barbados, and for any borrowing by authorised dealers to finance their domestic operations. This is captured in the indices, with capital account liberalisation being around 7.5 for the latter years. The *IFL* index of 9.5 for Barbados in 2002 reflects the fact that the Central Bank still maintains a hold over capital account transactions and also that the surrender of proceeds for exports and invisibles is mandatory. Since Barbados operates under a fixed exchange rate regime, which it has steadfastly defended over the last three decades, it requires rigid capital controls to maintain the peg as otherwise there could be a run on reserves. Controls break the link with the major country to which Barbados is pegged. For this reason we observe that the Capital index is currently one of the lowest in the region, even lower than that of the OECS area, which also operate a fixed exchange rate system. However, the pooling of reserves by the eight member countries of the OECS appears to permit more relaxed controls.

Nevertheless, even within the OECS, there are noticeable differences in the indices. More specifically, the index for Antigua and Barbuda shows that they are far more liberalised than say, Grenada or even Dominica. At first glance it would appear inconsistent for Antigua & Barbuda, a member of the OECS, to be classed as almost fully financially liberalised from the early 1980s and not the other member countries. One view expressed by market participants is that this is because of the precarious fiscal policies pursued. In order to sustain such "bad" fiscal policies, it was necessary for the authorities to open up to foreign capital to close the savings - investment gap

El Hadj (1997) argues that Trinidad and Tobago had active government intervention in the financial sector in the 1980s; this is evident in an index of 5.5 for Trinidad and Tobago..

Table 3: Indices of Capital Account Liberalisation and International Financial Liberalisation in the Caribbean

	Antigua & Barbuda		Barbados		Belize		Dominica		Grenada		Guyana		Jamaica		St. Kitts & Nevis		St. Lucia		St. Vincent		Suriname		Trinidad & Tobago	
	C	IFL	C	IFL	C	IFL	C	IFL	C	IFL	C	IFL	C	IFL	C	IFL	C	IFL	C	IFL	C	IFL	C	IFL
1979	4	11	1.5	6	3	7	2	6.5	2	6.5	1	5.5	0.5	4.5	-	-	2	7	2	6.5	2	6.5	1.5	5.5
1980	4	11	1.5	6	3	7	2	7	2	6.5	1	5.5	0.5	4.5	-	-	2	7	2	7	2	6.5	1.5	5.5
1981	4	11	1.5	6	3	7	2	7.5	2	6.5	1	5.5	0.5	4.5	-	-	2	7.5	2.5	8	2	6.5	1.5	5.5
1982	4	11.5	1.5	6	3	7.5	2	7.5	2	6.5	1	5.5	0.5	4.5	-	-	2	7.5	2.5	8	2	6.5	1.5	5.5
1983	4	11.5	1.5	6	3	8.5	2	7.5	2	6.5	1	5.5	0.5	5	-	-	2	7.5	2.5	8	2	6.5	1.5	5.5
1984	4	12.5	1.5	6	3	8.5	2	7.5	2	6.5	1.5	6	0.5	5	2.5	7	2	7.5	2.5	8	2	6.5	1.5	5.5
1985	4	12.5	1.5	6	3	8.5	2	7.5	2	6.5	1.5	6	0.5	5	2.5	8	2	7.5	2.5	8	2	6.5	1.5	5.5
1986	4	12.5	1.5	6	3	8.5	2	7.5	2	6.5	1.5	6	1	5.5	2.5	8	2	7.5	2.5	8	2	6.5	1.5	5.5
1987	4	12.5	1.5	6	3	8.5	2	7.5	2	6.5	1.5	6	1	6	2.5	8	2	7.5	2.5	8	2	6.5	1.5	5.5
1988	4	13	2	6.5	3	9	2	8	2	7	1.5	6	1.5	6.5	2.5	8.5	2	8	2.5	8.5	2	7	2	6.5
1989	4	13	2	6.5	3	9	2	8	2	7	1.5	6.5	1	6	2.5	8.5	2	8	2.5	8.5	2	7	2	6.5
1990	4	13	2	6.5	3	9	2	8	2	7	1.5	7.5	1	6.5	2.5	8.5	2	8	2.5	9	2	7	2	6.5
1991	4	13	2	6.5	3	9	2	8	2	7	2	8.5	4	13	2.5	8.5	2	8	2.5	8.5	2	7	2	6.5
1992	4	13	2	6.5	3	9	2	8	2	7	3	11	4	13	2.5	8.5	2	8	2.5	9	2	7	2	7.5
1993	4	13	2	6.5	3	9	2	8	2	7	3	11	4	13	2.5	8.5	2.5	8.5	2.5	9	2	7	4	13
1994	4	13	2	7.5	3	9	2	8	2	8	3	12	4	13	2.5	8.5	2.5	8.5	2.5	9	2	7.5	4	13
1995	4	13	2	7.5	3	9	2	8	2	8	4	12	4	13	2.5	8.5	2.5	8.5	2.5	9	2	7.5	4	13
1996	4	13	2	7.5	3	9	2	8	2	8	4	12	4	13	2.5	8.5	2.5	12	2.5	9	2	7.5	4	13
1997	4	13	2	7.5	3	9	2.5	9	2.5	8.5	4	13	4	13	2.5	8.5	2.5	12	2.5	9	2	7.5	4	13
1998	4	13	2	7.5	3	9	2.5	9	2.5	8.5	4	13	4	13	3	9	2.5	12	2.5	9	2	7.5	4	13
1999	4	13	2	7.5	3	9	2.5	9	2.5	8.5	4	13	4	13	3	9	2.5	12	2.5	9	2	8	4	13
2000	4	13	2	7.5	3	9	2.5	9	2.5	8.5	4	13	4	13	3	9	2.5	12	2.5	9	2	8	4	13
2001	4	13	2.5	9	3	9	2.5	9	2.5	8.5	4	13	4	13	3	9	2.5	12	2.5	9	2	8	4	13
2002	4	13	2.5	9.5	3	9.5	2.5	9	2.5	8.5	4	13	4	13	3	9	2.5	12	2.5	9	2	8	4	13
2003	4	13	3	11	3	9.5	2.5	9	2.5	8.5	4	13	4	13	3	9	2.5	12	2.5	9	2	8	4	13

throughout the 1980s. The movement of the index from 5.5 to 6.5 in the late 1980s and then to 7.5 in 1992 reflects the government decision to move to a dual exchange rate in the late 1980s and early 1990s and the removal of exchange controls on trade in services and capital flows in 1991. In 1993, Trinidad & Tobago introduced a floating exchange rate and removed all restrictions on the capital account; this is captured in the *IFL* index, which moved from 7.5 to 13

In the 1980s, Jamaica had one of the most complicated financial systems in the region, consisting of a number of restrictions and regulations. The *IFL* index for Jamaica was 5.5 in the early 1980s highlighting the fact that restrictions on current account payments and capital flow controls were used extensively. Jamaica began financial sector reforms in 1985, but undertook an extensive process of financial liberalisation in its effort to achieve macroeconomic stability in 1991. Currently the index for Jamaica is 13 emphasising the fact that Jamaica is one of the most financially liberalised economies in CARICOM.

According to El Hadj (1997), Guyana had a highly restrictive trade regime consisting of trade prohibitions, quantitative restrictions and licensing for both exports and imports. The *IFL* index for Guyana was 5.5 in the early 1980s. The movement of the indices from 6.5 in 1989 to 7.5 in 1990 and 8.5 in 1991 is indicative of the fact that the Guyanese government had begun a process of restructuring and privatising the financial sector. El Hadj also points out that the government of Guyana had undertaken the supervisory functions necessary for stabilising a liberalised financial system. This is captured in the *IFL* indices as it reflects Guyana making steady steps to full liberalisation (5.5 to 6 to 6.5 to 7 etc) and not a major jump as Jamaica did in 1991 (6.5 to 13) and Trinidad in 1993 (7.5 to 13).

Overall the indices imply that all the CARICOM countries have made significant progress in the opening up to the flow of international capital, although a few still maintain restrictions on their capital accounts. Alesina and Perotti (1994) postulate that “strong” governments are less likely to ease capital account restrictions. Correlation of the indices with financial conditions in some of the CARICOM countries allows one to conclude that overall the indices are reliable and accurately reflect the process and degree of *IFL* in the region.

Comparison with Alternative Indicators

The first comparison is with the “on/off” summary dummies of the *AREAER*. The *AREAER* report was revamped in 1996 and thus introduced a structural break in the summary indicators. To deal with this, we apply a similar methodology to that of Miniane (2004) where the summary indicators of the post-1996 editions are extended to the pre-1996 period using

the detailed text of the pre-1996 editions. However, whereas Miniane concentrates solely on capital account liberalisation and thus only extends the summary indicators relating to capital account restrictions, we are also interested in IFL and hence extend back all the summary indicators.

To construct our indices across both periods, we start with the *AREAER* editions of 1996 to 2004 (note that each report presents the information for the previous year) and sum across the five categories; exchange rate structure, arrangements for payments and receipts (averaging across its two sub-categories), controls on payments for invisible transactions, proceeds from exports and/or invisible transactions (averaging across its two subcategories) and capital account transactions (averaging across its 13 subcategories).

Since there are five main categories, each taking on a value of 1 if no restrictions are in place or a 0 otherwise, the maximum value for the IFL index for any country is 5. In addition, the resulting value for the category of capital account transactions gives us our index of capital account liberalisation (*C*), which has a maximum value of 1. The next task is to extend the indices back to the pre-1996 period. For this we start with the detailed text of the 1995 edition and code (assigning a value of 1 if no restrictions are in place or a 0 otherwise) as many of the 5 main categories and their sub-categories as possible for the year 1994. Next, we use the "Changes" sections of both the 1995 and 1996 editions to code any remaining sub-categories. If after this we are unable to assign a value to a particular sub-category, we give it the value it had in 1995. The process is repeated for each year back to 1979.[3]

Although the indices constructed from the IMF dummies and our new set of indices based on the disaggregated data are in general agreement concerning the evolution of capital and financial liberalisation, in some cases they differ slightly. These differences can usually be attributed to inconsistencies between the narrative and summary dummies of the respective *AREAER*. For example, our index of capital account liberalisation scores Belize as having a closed capital account throughout the sample and seems at odds with the pre-1999 index C, which suggests it had an open capital account up to 1985. However, closer inspection of the pre-1996 summary indicators suggests that these are themselves not consistent with the narrative of the text on which they are based. In each edition of the report up to that of 1995, the text under the heading of "Capital" is the same for Belize – *All capital transfers require approval of the Central Bank but control is liberally administered*. Yet, the summary table

[3] Again, in an effort to conserve on space, the resulting indices for *C* and *IFL* and their sub-indices are not presented here but are available from the authors.

scores the capital account as being open for the period up to and including 1985 and closed thereafter. Our construct avoids this inconsistency by being fully rules-based, in that, unless the text indicates explicitly that a particular restriction is not operative or enforced, we score it as being in place. The failing of the AREAER to provide consistent information in this case becomes even more apparent with the new reporting format of the 1996 edition, where each of the 13 sub-categories of Capital Transactions is listed as having restrictions in place, even though the exchange control stance of Belize had not changed. Take another example, that of Guyana, where the narratives of both the 1992 and 1993 editions report the country as having a market-determined exchange rate system and, in addition, that there were no taxes or subsides on the purchase or sale of foreign currency during those years. Nevertheless, the summary table codes 1991 as having no exchange restrictions and 1992 as having exchange rate restrictions (more than one rate for imports and exports, import rates different from export rates and a separate exchange rate for capital transactions), even though the wording in the detailed texts is identical.

The indices are generally consistent with our modified Quinn indices in terms of the degree of openness across countries, where Antigua and Barbuda, Trinidad and Tobago, Jamaica and Guyana are considered as being the most opened, and Barbados and the other OECS countries as being more restrictive.

However, even though the measure for capital account liberalisation covers 13 sub-indices, it still does not allow for varying intensities; a sub-category either has restrictions in place or it does not. As mentioned earlier, this is the main limitation of 0/1 indicators.

We also construct several outcome-based measures of international financial openness. As discussed in the review section, the main assumption here is that more capital inflows, as a share of GDP, indicate greater *IFL*. However, this may not necessarily be the case as many factors can influence capital flows and some may have absolutely nothing to do with openness. Yet, these are often used in empirical analysis because of the availability of data and because they are less prone to subjectivity.

We look at four outcome-based variables; two based on flows and two based on stocks. The flow variables are in line with Kraay (1998) and are the sum of FDI and portfolio inflows as a share of GDP and combined FDI and portfolio net flows also expressed as a ratio of GDP The stock variables are accumulated FDI and portfolio inflows to GDP and accumulated net FDI flows and net portfolio flows as a share of GDP.

The stock variables are defined as cumulative flows, starting mostly in the mid-1970s, depending on data availability. One drawback in calculating the stock measures is that it is not possible to include the capital stocks that were in existence, if any were, at the beginning of the period. Also, we do not have sufficient information to incorporate valuation changes as Lane and Milesi-Ferretti (2001) did. Unfortunately, the only Caribbean countries included in the data set of Lane and Milesi-Ferretti are Jamaica and Trinidad and Tobago. Nevertheless, in comparing our net-stocks index (which is the closest to their definition) with theirs for these two countries we obtain correlation coefficients of 0.81 and 0.76 for Trinidad and Tobago and Jamaica, respectively. More importantly, the general trends are similar.

Another point to note about the construction of the outcome based measures is that outflows of both direct and portfolio investment from Caribbean countries tend to be rather small amounts. Thus, there is very little difference between the two flow variables, whether we look at inflows or the net position, and similarly, little difference between the stock variables.

The flow variables, though quite volatile, appear in most cases to be higher in the latter half of the sample period, which implies an increasing degree of financial openness for these countries. However, their volatile nature makes it difficult to rank the countries in terms of openness. In this regard, the stock variables may be more informative. The move towards greater openness in the early 1990s is clearly evident in the individual country series. In addition, the ratios being larger for some countries, for example the OECS, suggests that they are more open to the flow of international capital than others, such as Barbados, Guyana and Jamaica. However, it is in the ranking that these indicators differ from our rule-base modified Quinn indices. This reinforces the point that there are other factors beyond openness that influence these ratios. For example, placing Jamaica lower than any of the OECS countries, with the exception of Antigua and Barbuda, is not consistent with the AREAER, which shows Jamaica having significantly less restrictions on capital transactions. Indeed, the counter argument is that outcome-based measures are not expected to be identical to the rules-based measures and, furthermore, that there is no need to conclude that one measure is better than another.

Figure 1 plots our index of IFL (*IFLindex*), the alternative measure which we construct from the disaggregated *AREAER* dummies (*AREAERindex*)[4], and our preferred outcome-based measure, the stock of capital inflows (*stocks*). In analysing Figure 1 it is perhaps best to relate the two alternative indices (*AREAERindex* and *stocks*) to *IFLindex*, which we have

[4] The two rules-based measures have been rescaled out of 100 for comparative purposes.

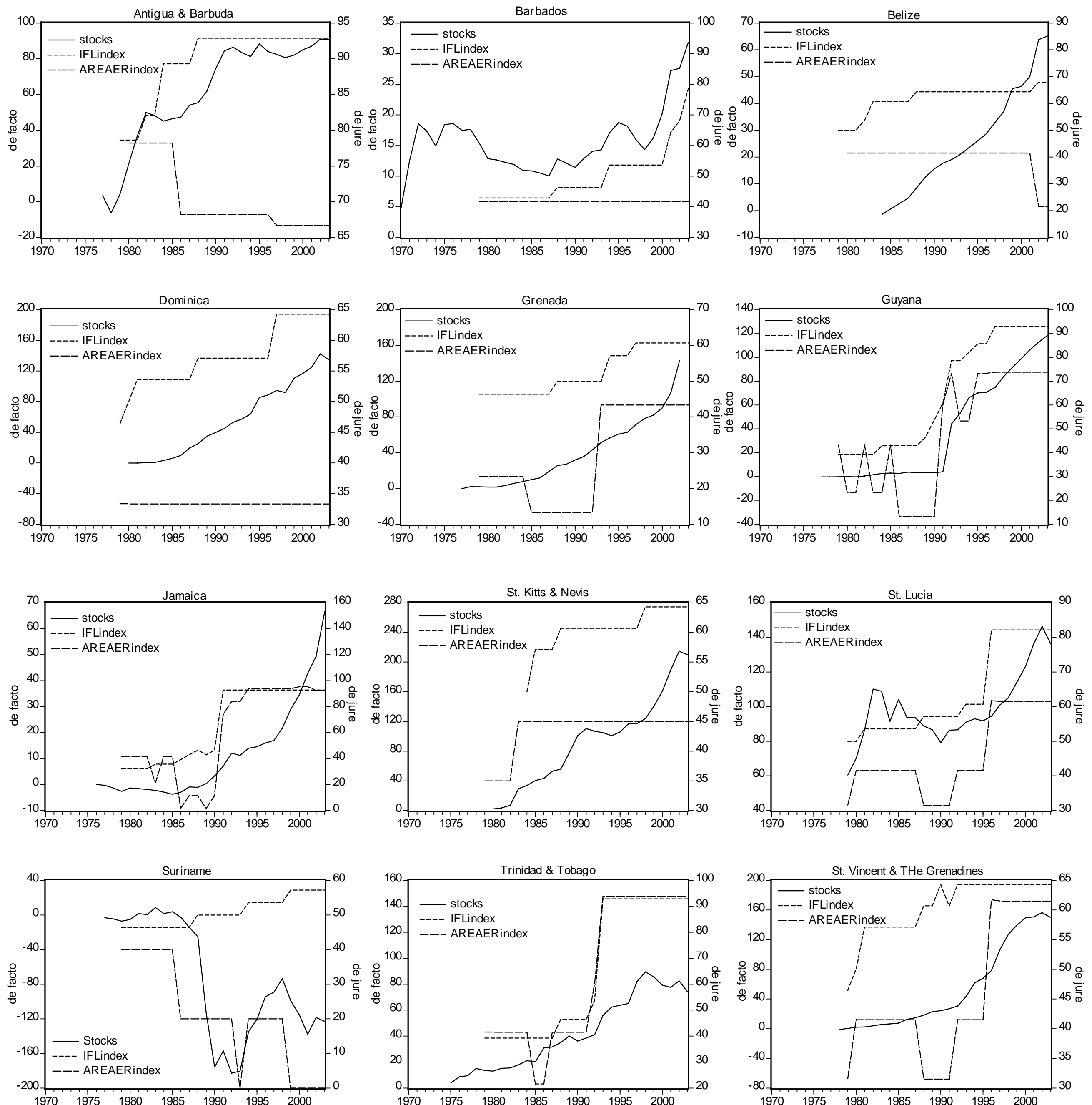
already discussed in detail. In this regard, the first main point that can be derived from these plots is that the outcome-based measure paints a similar picture to *IFLindex* concerning the evolution of IFL for every country in the sample, with the exception of Suriname. In fact, for some countries the two measures are highly correlated. For example, the *stocks* index for Barbados began rising in the latter half of the 1980s and picked up momentum in the late 1990s, which coincides well with *IFLindex*, the correlation coefficient being 0.96. Another example is that of Guyana where there is a relatively high correlation between the two indices (0.87).

The other main observation is that there is an almost even split between the number of countries where *AREAERindex* in agreement with the other two indices and where it is not. For those countries where it is not in agreement, it is more than often indicates that the level of IFL did not change over the period, as in the cases of Barbados and Dominica, or involved only one change as with Belize and St. Kitts and Nevis. This may be reflecting the fact that for the *AREAERindex* to change, each sub-category of any main category must change. For example, the detailed text of the 1989 *AREAER* for Barbados states under the heading "Changes During 1988" that *Authorised dealers were empowered to approve, without reference to the Central Bank, applications for foreign exchange remittances of cash gifts, legal fees, ….* Thus, the *IFLindex* would have increased by 0.5 points during 1988 reflecting the easing of restrictions on the category "Payments for Invisibles", in accordance with our coding rules. However, since there are still limits on certain transactions within that category, the *AREAERindex* remains unchanged.

Perhaps a more extreme case of the above is that of Antigua and Barbuda, where the *AREAERindex* actually declined over the period, suggesting a tightening of restrictions. This is the only instance where the *AREAERindex* depicted a completely opposite trend to the other two indices. Antigua and Barbuda began the period with a high value for the *AREAERindex* (3.9 out of a possible 5). This is because it had the highest capital account liberalisation score in the sample (a 0.9 out of a possible 1), reflecting the fact that it had only 1 restriction in place on the capital account (out of a possible 13) which was *Ministry of Finance approval is required for the extension of financial & commercial credits to non-residents*. In 1986, the detailed text indicated that *Arrears are maintained with respect to external accounts* and thus the NewDummies index fell from 3.9 to 3.4, then in 1996 the text stated that *Purchases of local real estate by non-residents needed the approval of cabinet and the applicant must have an alien landholding license*, consequently the index dropped to 3.3. However, if we consider that *IFLindex* makes allowance when approval, though required, is liberally or routinely given, and that in both the above instances this have been

the case, then these would not have resulted in a decline in the *IFLindex* index. In addition, *IFLindex* incorporates international agreements and *AREAERindex* does not.

Figure 1: Measures of International Financial Liberalisation Compared



6. Measuring Domestic Financial Liberalisation in the Caribbean

To construct our rules-based measure of DFL we code the various possible restrictions that can be imposed on the financial system, which is discussed in the review section and identified in Table A1, Panel B dimensions I-VI. Specifically, our index is based on the

following five dimensions: credit controls; interest rate controls; entry barriers; state ownership; and regulations, which combines regulation of operations and prudential regulations. Each dimension is assigned a value of 0, 0.5 or 1 where a 1 indicates full liberalisation; thus the index has a maximum value of 5. The criteria for assigning the values are presented in Table 4 and although there is always a degree of subjectivity involved in rules-based indicators, by applying the coding rules in a consistent manner for each country, we in effect reduce the amount of subjectivity involved.

We attempt to collect data on the various policies and regulations implemented in the financial sectors of the individual Caribbean countries. However, this proved extremely difficult since, unlike the case of IFL where the IMF systematically collects and publishes data on rules and regulations affecting the flow of international finance, there is no centralised agency documenting the rules and regulations governing operations of the domestic financial systems. Thus, we rely on the various publications of the individual central banks, their websites and any published information on the financial systems. Unfortunately, we could only gather sufficient information to construct the indices for Barbados, Jamaica and Trinidad and Tobago.[5]

Figure 2 presents the indices for the above three countries and shows a similar pattern of evolution in terms of the liberalisation of their domestic financial systems. All three countries had fairly restrictive systems prior to the mid-1980s. They then embarked on a process of gradual liberalisation over the next decade and maintained fairly liberal systems thereafter. Another broad conclusion we can draw from the chart is that Trinidad and Tobago had the most liberalised financial sector of the three countries through the sample period. Finally, there are a number of stops and reversals of the liberalisation process in the cases of Barbados and Jamaica.

Barbados began the period with an index value of 2.5, reflecting mainly the absence of selective credit controls, while the legal cash reserve and securities requirements were only 2 and 1 percent, respectively. However, the Central Bank of Barbados (CBB) had only just

[5] In the case of Barbados, we rely heavily on the Central Bank of Barbados publication *Chronicle of Central Bank Policy: 1972-2004*. For Trinidad and Tobago, we obtain similar chronological information from the Central Bank of Trinidad and Tobago (CBTT), however, these were not publicly available at the time of our research and thus we are grateful to the CBTT allowing us to use it. Since there is no extensive chronological compilation of financial policies in Jamaica, either published or unpublished that we are aware of, we rely on a number of sources including: the Bank of Jamaica Annual Statistical Digest of July 2005; *Bank of Jamaica - The First 40 Years 1961-2000,* a 2004 publication of the Bank of Jamaica (BOJ); Jamaica's Financial System – Its Historical Development, published by BOJ in 1991; and the works of Peart (1995) and Williams (1996).

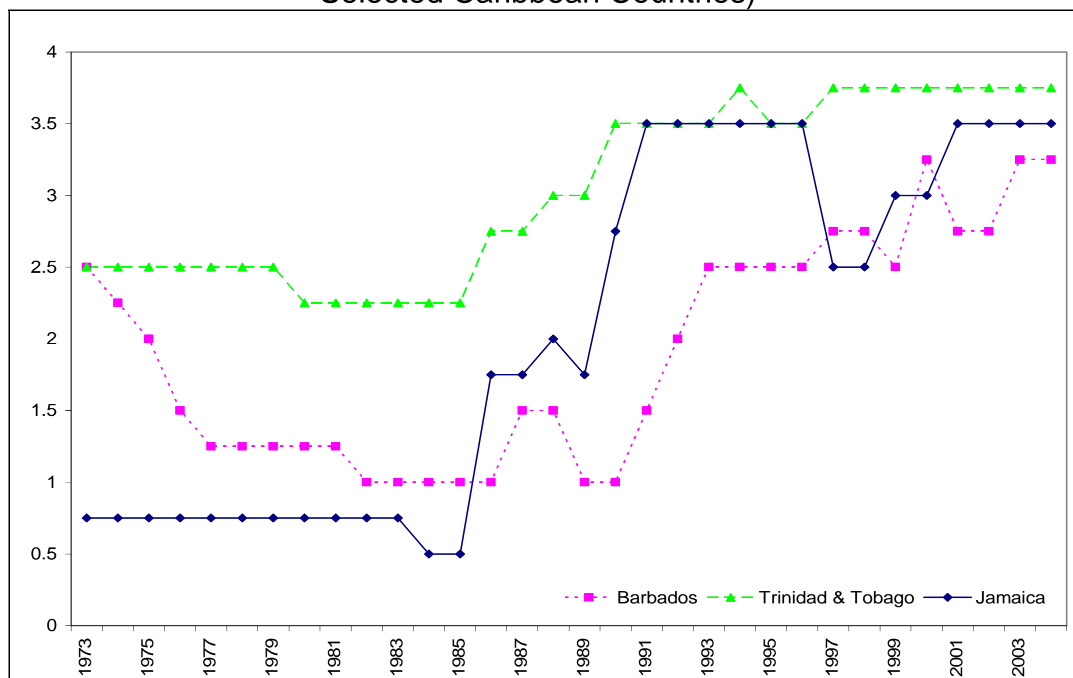
been established and its inception unfortunately coincided with a period rising inflation, liquidity problems in the financial system and a deteriorating external position (Haynes and Holder, 1989). As such, the CBB sought to stabilise the economy and channel the flow of credit away from the consumption-oriented to the productive sectors. Thus, over the next few years the CBB utilised selective credit controls, continually increased the reserves requirements and manipulated interest rates. These policies actions are responsible for the index falling to 1.25 by 1976 and further declining to 1 by 1982. The main positive contributing factor to the index over this period is the existence of legislation allowing for prudential regulations with respect to the commercial banks; however, these were limited to capital requirements and concentration ratios.

Table 4: Criteria used in defining Domestic Financial Liberalisation

Values	Descriptions
	Credit Controls: Directed credit
0	Controls on credit are pervasive; sectoral credit ceilings and selective credit restrictions are widely employed.
0.5	Controls on credit are not pervasive; there are some sectoral credit restrictions in place.
1.0	There are no quantitative credit restrictions.
	Credit Controls: Excessively high reserves ratios
0	Reserve ratios are greater than 25 percent.
0.5	Reserve ratios are between 10 and 25 percent.
1.0	Reserve ratios are below 10 percent.
	Interest rate controls
0	There are restrictions on interest rates; Ceilings and floors are in place or rates are only allowed to vary within a band.
0.5	Some interest rates are allowed to be market determined.
1.0	All rates are market determined.
	Entry Barriers
0	Licensing requirements are used to limit entry and there are limits to the participation of foreign banks and restrictions on bank specialisation.
0.5	Licensing requirements are in place but are transparent. There are no limits to the participation of foreign banks or restrictions on bank specialisation.
1	In addition to the above, laws have been enacted to increase bank competition.
	Regulations
0	Operational restrictions are present.
0.5	There are no operational restrictions but clearly a need to improve the regulatory and supervision framework (e.g. the adoption of international guidelines).
1	There are no operational restrictions and policies have been implemented to strengthen the regulatory and supervision framework.
	State ownership
0	The banking sector is dominated by state-owned banks.
0.5	There is some state ownership of the banking system but it is less than 25 percent.
1	The state has no ownership in the banking system.

The restrictive policy framework was maintained until 1991, when the CBB began the process of financial liberalisation as part of the IMF's structural adjustment programme. The ceiling on the average lending rate was removed in August 1991, and the Rate of Interest Order of 1973 was revoked in 1992 with financial institutions being allowed to set their own mortgage rates. However, the CBB continued to administer a minimum deposit rate, which it used for monetary policy purposes. Selective credit controls were abandoned in 1993 and reserves requirements were gradually reduced (accounting for the moderate upward trend in the index from the latter half of the 1990s) and now stands at 17 percent (5 percent cash reserve and 12 percent securities requirement). In addition, new legislation was enacted in 1992 giving increased regulatory and supervisory powers to the Central Bank.

Figure 2: Indices of Domestic Financial Liberalisation (for Selected Caribbean Countries)



The index also depicts episodes of policy reversals. For example, credit ceilings were removed in 1987 but then reinstated in 1989 and we see the index rising and falling over this period. Again, in 1999 the index dipped, as the combined reserve requirement went above 25 percent, but recovered quickly and peaked to 3.25 in the following year, as the ratio again slid below 25 and the government also began the process of privatising the only state-owned bank. However, in 2001 and 2002 the introduction of indicative lending rates for commercial banks caused the index to drop to 2.75; however these were abolished in 2003. Thus, our index appears to fit the stylised facts of the liberalisation process in Barbados quite well.

At the start of the sample period, Trinidad and Tobago also had an index value of 2.5 and maintained this until 1980. As with Barbados, selective credit controls were used extensively by the CBTT to curb consumer instalment credit; however, unlike its counterpart, the CBTT never placed direct controls on interest rates but relied mainly on the rediscount rate to signal warranted interest rate changes. In addition, the cash reserve requirement remained below 10 percent during this period (commercial banks were persuaded to voluntarily hold a secondary reserve in the form of Government securities). In 1980, commercial banks were instructed to maintain additional reserves equivalent at 15 percent of any increase in deposit liabilities over levels prevailing at the end of 1979, and this explains the slight dip in the index in 1980.

Nothing significant in terms of financial liberalisation occurred during the first half of the 1980s. However, following the collapse of several non-bank financial institutions, the Central Bank Act and the Financial Institutions (Non-Banking) Act (1979) were amended in 1986 to broaden the supervisory powers of the CBTT and also provided for the establishment of a deposit insurance corporation and a deposit insurance fund, which required the compulsory membership by all licensed financial institutions. Capturing this improvement in the regulatory framework, the index increased to 2.8 in 1986. Over the next couple of years the liberalisation process continued to gain momentum, reflected in the index reaching 3.8 by 1994. During this period selective credit controls were gradually phased out and were eliminated by 1994. In addition, the regulation and supervision of the financial system was enhanced with the passage of the Financial Institutions Act (1993) and a shift towards risk-based supervision by the CBTT. Also, the government launched its privatisation programme, beginning with the Development Finance Company. Except for the two years (1995 and 1996) when the reserve ratio exceeded 25 percent, there were no significant changes to the liberalisation stance. The ratio currently stands at 11 percent (end of 2004).

Many commentators, including Peart (1995), King (2000) and the World Bank (2003), argue that Jamaica had one of the most repressive financial systems in the Caribbean region during the 1970s to mid-1980s. It was characterised by restrictions on interest rates, the wide use of quantitative credit controls, excessively high reserve ratios, government involvement in the operations of financial institutions and bureaucratic controls on entry. This description of Jamaica financial system is borne out in our index, which is the lowest of the three indices for the period up to 1985. The index commenced the period with a value of 0.8, with the only positive contributing factors to the index being the weighted average of the cash and liquid assets ratio of 21 percent, which is below the 25 percent criterion (see Table 4). The Banking Law of 1960 provides a regulatory framework for the prudential oversight of

commercial banks. However, the Bank of Jamaica, faced with depleting external reserves, widening fiscal deficits and the adverse economic shocks of the 1973 international oil crisis, continued to use the required reserves ratio (particularly the liquid assets ratio) as part of their monetary policy to restrain credit expansion and redirect it to priority areas. By 1984, the required cash and liquid assets ratios had reached 14 and 40 percent respectively, which is captured by the fall in our index in that year.

In 1986 Jamaica embarked on a process of financial liberalisation as part a World Bank structural adjustment loan agreement. Peart (1995) notes that the reform of interest rate policies, monetary policy implementation and the development of the money and capital markets were the main areas of focus. To this end, the overall ceiling on private credit extended by commercial banks and other financial institutions was removed, leaving just the ceiling on consumer credit. There was a phased reduction in the liquid assets ratio over the period 1986-1988, from 38 percent to 20 percent, equating it with the cash reserve ratio. In addition, the BOJ introduced certificates of deposits, with a market-determined interest rate, to facilitate monetary policy. Also, as part of the structural adjustment loan agreement, the government embarked on the privatisation of the sector by selling 51 percent of the shares in the National Commercial Bank, the largest commercial bank, in 1986. Our index is consistent with these observed liberalisation efforts, rising significantly in 1986, reflecting the easing of credit restrictions and the privatisation, and climbing even further in 1988 as the weighted average reserve required ratio fell under 25 percent.

Credit ceilings were re-imposed in 1989, which Peart (1995) argues was an unavoidable necessity given the exigencies following the destruction caused by Hurricane Gilbert during that year. However, these were eventually eliminated in 1991. The savings deposit rate was deregulated in the previous year. Our index rose significantly in 1990 following the removal of interest rates restrictions and again in 1991 after the abolishment of quantitative credit restrictions and the privatisation of the Workers Savings and Loan Bank. However, between 1991 and 1996 the index is unchanged. This is because the BOJ continued to use reserve requirements, in particular the liquid assets ratio, to influence credit flows; by 1993 the cash reserve requirement had reached 25 percent and the liquid asset requirement 50 percent. The cancelling effect of these policies is reflected in our index remaining unchanged between 1991 and 1996. King (2000) posits that reserves ratios were moved to levels that were much higher than prudentially necessary and constrained the sector from performing

the amount of intermediation that would otherwise have obtained.[6] King concludes that the effect of the abandonment of credit and interest rate controls was contradicted by high reserves.[7]

During this period, the number of financial institutions increased by over 94 percent (King, 2000) aided by the absence of entry barriers. However, the supervision and regulation of these institutions was inadequate and did not provide sufficient sanction and intervention powers to bank supervisors (World Bank, 2003). In addition to the weak regulatory framework, the Planning Institute of Jamaica (1999) notes other deficiencies in the financial system including: the mismatch of assets and liabilities; the increasing level of non-performing loans; and rapidly rising operating costs. All this within an environment of rising inflation (over 80 percent), lower real output (less than 1 percent) and increasing government domestic debt, which expanded from roughly 21 percent in 1991 to almost 40 percent by 1996. Thus, by 1996 the banking system was in crisis and forced intervention by the government.[8] Part of the Government's response was a substantial reversal of the earlier privatisation process in an effort to prevent the collapse of many of these institutions. In fact, by the end of 1998, the Government had the majority ownership in all but one commercial bank, all but two insurance companies, along with several non-bank institutions (King, 2000). This is consistent with the decline in our index in 1997 and 1998. The index rises over the remainder of the sample period as Government restructured the financial system[9], including improving the regulatory and supervisory framework.[10]

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[6] Similarly, Peart (1995) suggests that the reserve ratios were above levels required for prudential purposes and in effect provided government with a captive market for the financing of its deficit and distorted the allocation of credit in favour of the public sector.

[7] According to Lander and Zavala (2002), the contractive monetary policy was an attempt to control high inflation but had the effect of increasing real interest rates, which adversely impacted on portfolio quality, investment, economic activity and fiscal accounts. In addition, the rise in interest rates encouraged short term capital inflows, increasing the liquidity of the system, and thus forcing the Central Bank to adopt a contractionary monetary policy stance to fight this effect and to control inflation. This however encouraged the rise of interest rates, thus resulting in a vicious circle.

[8] The Jamaican 1996 banking crisis has been extensively discussed in the literature (see for example, King, 2000; Lander and Zavala, 2002; and the World Bank, 2003) and often in the context of how not to liberalise a heavily restrictive system.

[9] In mid-1996, the Financial Institutions Services (FIS) institution was created to solve the liquidity and solvency problems of the banks. Early in 1997, the Financial Sector Adjustment Company (FINSAC) was created to manage the failed financial institutions through three stages: intervention, rehabilitation/investment, and privatisation (divestment). In March 1998, FINSAC acquired the five insurance companies and the five commercial banks.

[10] The Banking Act, the Financial Institutions Act and the Building Societies Act were amended in late 1997 with the main purpose of empowering the regulatory authorities to take decisive action to bring about the restructuring of any financial institution which ceases to be viable. A Deposit Insurance Act was passed in 1998 and in March 2001 Parliament approved the Financial Services Commission Act, designed to strengthen financial sector supervision.

Comparison with Alternative Indicators

The first indicator, Liquid Liabilities to GDP (*LLY*), measures the size of the financial sector relative to the economy and is often referred to as an indicator of financial depth. It is the broadest measure of financial intermediation since it includes all three financial sectors (Central Bank, Deposit Money Banks and other Non-Bank Financial Institutions) and is calculated as the ratio of currency plus demand and interest bearing liabilities of banks and other financial intermediaries to GDP. It should however be noted that, on its own, this measure could lead to erroneous conclusions since it does not differentiate between the allocation to private and public sector entities. Thus, a financial system that is channelling most of its credit to state owned enterprises may be classed as having a developed financial system, when in fact it is failing in its role to efficiently allocate resources.

The second indicator, Deposit Money Bank Assets to Central Bank Assets (*B-CB*), measures the relative importance of commercial banks versus the central bank in the financial system. It is calculated as the ratio of deposit money bank assets to the sum of deposit money and central bank assets. The intuition behind this measure is that banks are better able than the central bank to execute the basic functions of the financial system (such as the allocation of resources, the mobilisation of financial savings and the evaluation of potential returns and risks of investment projects). Thus, it is expected that banks and other financial institutions will gain relative importance as the financial sector is liberalised.

The final indicator, Private Credit by Deposit Money Banks and other financial institutions to GDP (*PCY*), is a measure of the activity of financial intermediaries in one of their main functions; channelling savings to investment (Beck *et al.*, 1999). It captures credit to the private sector as opposed to credit to the public sector and concentrates on that issued by intermediaries other than the central bank. The assumption behind this measure is that financial systems that provide more private sector credit are doing more to improve mobilisation of savings and the facilitation of transactions than those that simply provide credit to the government and the public sector.

For comparative purposes we begin by first constructing the three financial indicators for the three Caribbean countries. In this regard, we draw on the data base of Beck *et al.* (2000)[11], which provides relatively consistent measures of various financial indicators across countries, and update where necessary using the IMF's International Financial Statistics (CD

[11] The database is available on http://www.worldbank.org/research/projects/finstructure/database.htm.

Rom July, 2005) and the World Development Indicators (CD Rom, 2004). The resulting indicators are presented by country in Figure 3 along with the rules-based index of DFL.

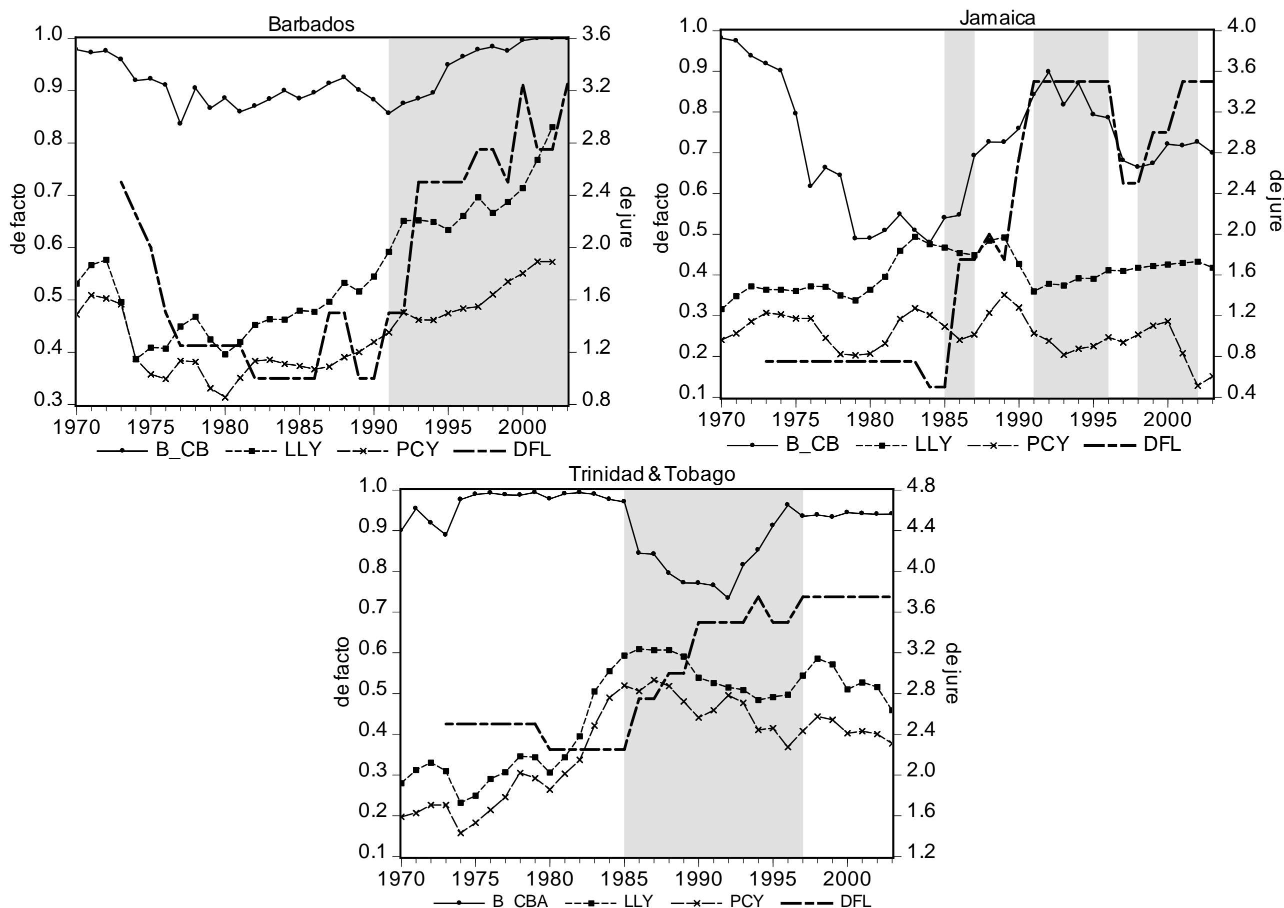
In the case of Barbados, all the indicators started rising at the beginning of the 1980s and have continued trending upwards. In addition, there is a high degree of correlation between our index of financial liberalisation and each of the other three financial indicators over the full sample period, with correlation coefficients of 0.81, 0.73 and 0.82 for *B-CB*, *LLY* and *PCY* respectively. However, as discussed above, the liberalisation process began in Barbados around 1991 and therefore we are particular interested in the behaviour of the indicators in the post-1991 period. In this regard, the average annual rate of increase of each indicator is higher for the period 1991-2003 than in the previous decade. In 1980 the *LLY* indicator had a value of 0.40 and by 1990 it had risen to only 0.54 (an annual average increase of 0.19 percent), while by 2003 it had expanded to 0.83 (an annual average increase of 1.1 percent). Both *B-CB* and *PCY* exhibit a similar pattern. The former rose at an annual average rate of 3.67 percent in the post-1991 period as compared with 2.37 percent in the 1980s, while the rates for the latter are 2.66 and 2.37, respectively. Thus, we can conclude that the post-1991 period in Barbados featured a more developed financial system than did the 1980s, greater involvement of the commercial banks relative to the central bank and higher levels of private sector credit, all consistent with our rules-based index of liberalisation.

Choosing a preferred outcome-based measure of domestic liberalisation for Barbados is not an easy task, as each indicator explains well the pre- and post-liberalisation periods. However, our preference is for *B-CB* because it has the highest pre-1991 correlation with the rules-based index (0.82 as opposed to 0.67 and 0.53 for *LLY* and *PCY*) and picks up best the turning points in the liberalisation process. For example, in 1993 the rule-based index increased as a result of the abolishment of selective credit controls and while the *B-CB* indicator also rose in 1993 the other two outcome-based measures did not; *LLY* remained unchanged from the previous year and *PCY* declined.

The chart for Jamaica suggests that the *B-CB* reflects the liberalisation process more closely than the other two indicators (the correlation coefficient between B-CB and our rules-based index is 0.52, as opposed to 0.05 and -0.4 for *LLY* and *PCY). B-CB* had been on the decline from the start of the sample and reached a low of 0.48 in 1984, identifying the BOJ as owning more than 50 percent of the total assets of the financial system for that year. In 1985 the ratio began to rise, which is consistent with the financial reforms of 1985-86, and continued to do so up until 1992. However between 1993 and 1998 the ratio trended

downwards which, as discussed above, is the period when the influences of the contradictory policies were strongest. Both the *LLY* and *PCY* indicators, which show hardly any evidence of financial intermediation during the 1990s, also substantiate this latter point. Thus, the stylised facts of the financial liberalisation process in Jamaica are clearly evident in our rules-based index and to a lesser extent in the B-CB indicator.

Figure 3: Measures of Domestic Financial Liberalisation



The outcome-based measures for Trinidad and Tobago appear to reflect more the underlying economic climate and less the liberalisation process. Between 1973 and 1982, the economy performed extremely well, aided by the significant increases in oil prices. During this period growth in real economic output averaged over 6.4 percent per annum, external reserves boomed (moving from US$ 58.3 million in 1973 to US$ 3.4 billion by 1982), the balance of payments recorded surpluses, and real incomes expanded at an average annual rate of 5.6 percent. Financial institutions benefited tremendously from the good economic fortunes as total financial assets rose from US$0.7 billion in 1973 to just over US$7 billion by 1982. In fact, this period in the evolution of the Trinidad and Tobago financial

system is characterised by high liquidity levels, a rapid expansion in private sector credit and an increasing number of financial institutions, particularly non-bank financial institutions. This rapid development in the financial sector is reflected in the outcome-based indicators over the pre-liberalisation period, 1970 and 1985.[12] *B-CB* is relatively high, averaging 0.97, while both *LLY* and *PCY* show impressive rates of expansion, the former increasing from 0.28 to 0.59 and the latter from 0.20 to 0.52.

In 1983 the Trinidadian economy slipped into a seven-year recession (real output fell by over 9 percent in the first year) as international oil prices began sliding, which had an adverse impact on the financial sector, with many of the non-bank financial institutions going under. Conditions worsened in 1986 with the collapse of oil prices and led to the authorities adopting an IMF stabilisation and structural adjustment programme in 1988, which included the reform and liberalisation of the financial sector as a key component.

As discussed earlier, the liberalisation process began in earnest in 1986 and culminated with the removal of credit restrictions in 1994. The outcome-based ratios declined gradually between 1983 and 1994 and, even after the liberalisation period, never returned to pre-liberalisation growth rates. One possible explanation of why the ratios, in particular *PCY*, did increased significantly after liberalisation is that the opening up of the financial sector and lifting of restrictions allowed corporations the option of doing their banking business offshore. Consequently, companies in the oil and gas business tended to source their financing offshore, as their borrowing needs were usually too large for the domestically-based banks (although the sector's output is a major contributor to GDP).

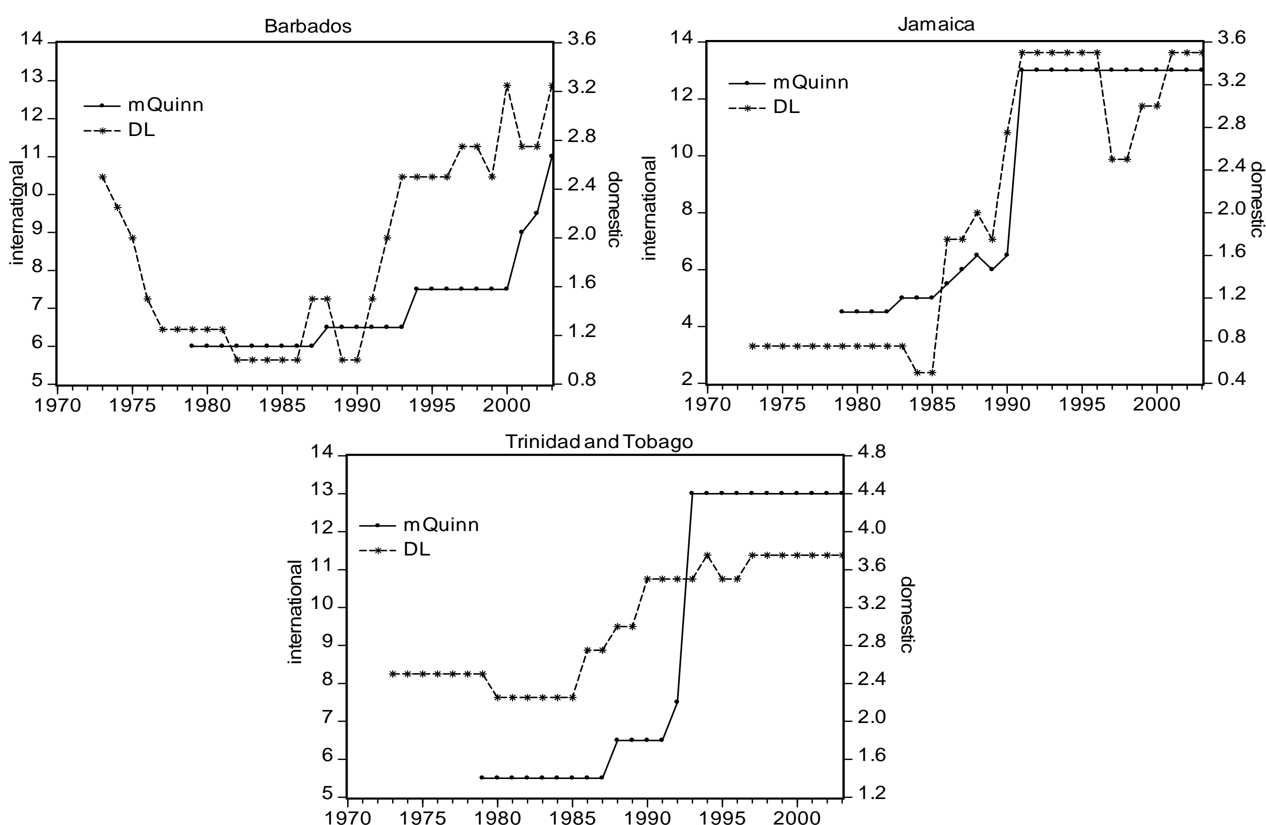
7. Sequencing of Domestic and International Liberalisation

Figure 4 examines the sequencing of domestic and external financial liberalisation for the three countries for which we have rules-based indicators in both areas, that being Barbados, Jamaica and Trinidad and Tobago. In each chart, the index for IFL, for which *IFLindex* is our preferred measure, is plotted on the left axis and the index for domestic financial liberalisation, our rules-based measure, on the right. The most obvious conclusion that can be drawn from the plots is that both the pace and sequencing of liberalisation varied considerably across the three countries.

[12] It could be a bit misleading to refer to this period as *pre-liberalisation* as this conveys the impression that the financial system was heavily restricted during this period with restrictions on all dimensions. However, this is not the case and in fact, as depicted in Figure 11, Trinidad and Tobago had the most liberalised financial sector of the three countries during this period. We are simply referring to the period before significant gains occurred in the liberalisation index.

Barbados began lifting restrictions on the domestic banking sector in 1991, with most of the effort occurring between 1991 and 1993, and continued gradually into the later years. At the same time it maintained restrictions on the flow of international capital, although there was some easing of restrictions on personal capital transactions (cash gifts, legal fees, commissions, dividends, travel and education) and capital market securities, where authorised dealers were allowed to approve (without reference to the CBB) applications for such remittances.

Figure 4: The Sequencing of Financial Liberalisation in Selected Caribbean Countries



Jamaica undertook domestic financial liberalisation and external financial liberalisation simultaneously and quite rapidly, with the majority of restrictions being removed between 1990 and 1993. As discussed earlier, little attention was paid to supervision and regulation during this period and the absence of entry barriers allowed an influx of financial institutions. In addition, previously nationalised financial institutions were privatised to weak investors (World Bank, 2003). The increased competition led to excessive risk taking by many financial institutions and, as Lander and Zavala (2002) note, the lax regulatory environment meant that (1) financial institutions did not properly manage the implicit credit risk they were

assuming, so that an oversized credit growth resulted, and (2) clear arbitrage opportunities arose for large financial conglomerates[13] and for large banks with international holdings. If we add to this the contradictory policy environment created by the removal of quantitative credit controls and rising reserve ratios, the resulting financial crisis of 1995-96 was inevitable. Thus, the Jamaica liberalisation story may be one of inappropriate sequencing, where IFL occurred before the domestic financial system was made ready to accommodate it.

The process of domestic financial reform and liberalisation in Trinidad and Tobago started in February of 1986 with the passing of the Central Bank Act and the Financial Institutions (Non-Banking) Act (1979) and culminated with the abolition of selective credit controls, effective from January 1, 1994. Significant liberalisation episodes along the way included the commencement of the phased reduction in quantitative credit restrictions in 1988, and the adoption of the Financial Institutions Act in August of 1993. However, considerable restrictions on the flow of international finance remained in place up until the elimination of exchange controls on current and capital transactions in April 1993.

Thus, unlike the Jamaican experience, greater attention was paid to supervision and regulation prior to and immediately after opening up to the flow of international capital. Note that there is only a 3-month gap between the removal of exchange controls and the passage of the Financial Institutions Act, which not only enhanced the regulatory structure but also brought the non-bank financial institutions under the same legislative framework as the commercial banks. This unification of regulatory and supervisory practices did not occur in the case of Jamaica. Perhaps it was the hindsight of the collapse of the five non-banks in the pre-liberalisation period that caused Trinidad and Tobago to tighten up the regulation of non-banks with the opening up of the financial sector.

8. Conclusion

This paper constructs indices of both domestic and international financial liberalisation for the Caribbean countries, and uses these to explore the nature and processes of financial liberalisation in the region.

[13] According to Green (1999), these large financial conglomerates usually comprised a merchant bank, a commercial bank, a building society, an insurance company and other business firms and were mainly formed to take advantage of the arbitrage opportunities created by the existence of differential reserve requirements and differences in supervision practices across the various sub-sectors.

With respect to international liberalisation, three of our indices, the two rules-based measures, *IFLindex* and *AREAERindex*, and the outcome-based measure, *stocks*, are consistent with the stylised facts for the individual countries. However, our preference is for the *INFindex* indicator over the *AREAERindex* as the former is capable of capturing more subtle changes in the process. We also favour the *IFLindex* over the *stocks* measure since the latter is influenced by polices other than liberalisation, as evident for a number of the countries, Jamaica being the prime example of this. Similarly, our rules-based measure of domestic financial liberalisation, constructed from chronological information on the rules and regulations of the individual countries, matches well our a priori knowledge of the liberalisation process in the respective countries. Unfortunately, we are only able to construct this for Barbados, Jamaica and Trinidad and Tobago, as data on regulations and policies are not available for the other countries. The *B-CB* index, which is the ratio of deposit money banks assets and the sum of deposit money and central bank assets, matches most closely with our preferred rules-based index among the other outcome-based indices of domestic financial liberalisation.

In terms of the process of financial liberalisation across the region, our main findings may be summarised as follows. First, our indices show that the order in which restrictions were removed, both on the domestic sector and on the flow of international finance, differed substantially across countries and over time. In addition, the pace of liberalisation differed by country and was often characterised by stops in and even reversals of policies. Also, we find that the countries typically proceeded with external liberalisation after or alongside liberalising the domestic sector, never liberalising external before liberalising domestically. . This is in keeping with the conventional thinking on the sequencing of liberalisation. In the case of Jamaica, however, not enough attention had been paid to the issue of prudential regulation and this led to other problems, culminating in a financial crisis.

Table A1: Possible Restrictions on the Financial Sector

PANEL A: RESTRICTIONS ON INTERNATIONAL FINANCIAL TRANSACTIONS		
A. Controls on Current Payments and Transfers		
I. Exchange Arrangement		
1	**Classification**:	Ranging from an exchange arrangement with no separate legal tender, currency board arrangement, pegged exchange rate and its various forms, to an independent float.
2	**Exchange rate structure**:	Unitary, dual or multiple.
3	**Exchange tax:**	Tax on foreign exchange transactions.
4	**Exchange subsidy**:	Subsidy for foreign exchange transactions using separate, nonmarket exchange rates.
5	**Forward exchange market**:	Is it prohibited or official cover of forward operations required?
II. Arrangements for Payments and Receipts		
1	**Prescription of currency requirements:**	Official requirements affecting the selection of currency and method of settlement for transactions with other countries.
2	**Payments arrangements between countries:**	Bilateral and regional payments arrangements, which can be operative or inoperative. Also, clearing, barter, and open accounts.
3	**Administration of control:**	
4	**International security restrictions:**	In accordance with IMF Executive Board Decision No. 144-(52/51) and also with UN sanctions.
5	**Payments arrears:**	Existence of an officially announced or unofficial queuing system for foreign currency to settle debts.
6	**Controls on trade in gold (coins and/or bullion):**	Existence of separate rules for trading in gold.
7	**Controls on exports and imports of banknotes:**	Existence of regulations on exports and imports of domestic and foreign currency bank notes.
III. Resident Accounts		. Foreign exchange accounts held domestically (prohibited, approval required). . Foreign exchange accounts held abroad (prohibited, approval required).
IV. Nonresident Accounts		. Foreign exchange accounts (prohibited, approval required). . Domestic currency accounts (prohibited, approval required).
1	**Blocked accounts:**	Existence of regulations prohibiting or limiting the conversion and/or transfer of balances.

Appendix Table A1 continued: Possible Restrictions on the Financial Sector

	V. Imports and Import Payments	
1	**Foreign exchange budget:**	Existence of a foreign exchange plan for the importation of specific types of goods and/or services.
2	**Financing requirements for imports:**	Existence of minimum financing, advance payments and/or advance imports deposit)
3	**Documentation requirements for release of foreign exchange for imports**	Domiciliation requirements, preshipment inspection, letters of credit, import licenses used as exchange licenses and other.
4	**Import taxes collected through the exchange system**	Taxes levied on foreign exchange made available for imports.
	VI. Exports and export proceeds	
1	**Repatriation requirements:**	. Obligations of exporters to repatriate export proceeds. . Regulation requiring the surrender of repatriated proceeds.
2	**Financing requirements for exports:**	Existence of export-financing regulation.
3	**Documentation requirements**	Domiciliation requirements, letters of credit, guarantees, preshipment inspection, and other.
4	**Export taxes collected through the exchange system**	Taxes levied on foreign exchange earned by exporters.
	VII. Payments for invisible transactions and current transfers	
1	**Trade-related payments:**	. Freight/insurance, unloading/storage cost, administrative expenses, commissions, and customs duties and fees, etc. . Prior approval requirements, quantitative limits, and bona fida tests.
2	**Investment-related payments:**	. Profits/dividends, interest payments, amortisation of loans or depreciation of FDI, and payments and transfers of rent etc. . Prior approval requirements, quantitative limits, and bona fida tests.
3	**Payments for travel:**	. Travel for business, medical treatment, tourism, etc. . Prior approval requirements, quantitative limits, and bona fida tests.
4	**Personal payments:**	. Medical expenditures abroad, study expenses abroad, pensions, and family maintaince/alimony, etc. . Prior approval requirements, quantitative limits, and bona fida tests.
5	**Foreign workers' wages:**	. Prior approval requirements, quantitative limits, and bona fida tests.
6	**Credit card use abroad:**	. Prior approval requirements, quantitative limits, and bona fida tests.

Table A1 continued: Possible Restrictions on the Financial Sector

No.	Item	Inflows	Outflows
7	**Other payments:**	. Subscription/membership fees, authors' royalties, legal fees, etc. . Prior approval requirements, quantitative limits, and bona fida tests.	
	VIII. Proceeds from invisible transactions and current transfers		
1	**Repatriation requirements:**	. Obligations of exporters to repatriate export proceeds. . Regulation requiring the surrender of repatriated proceeds. . Limitations on the use of receipts.	
	B. Capital Account Transactions		
		Controls on inward and outward capital flows	
		Inflows	Outflows
	I. Controls on capital and money market instruments		
1	**Capital market securities:** shares or other securities of a participating nature, and bonds and other debt securities with an original maturity exceeding one year.	. Local purchases by nonresidents . Sale/issue abroad by residents	. Sale/issue locally by nonresidents . Purchase abroad by residents
2	**Money market instruments:** securities with an original maturity not exceeding one year.	. Local purchases by nonresidents . Sale/issue abroad by residents	. Sale/issue locally by nonresidents . Purchase abroad by residents
3	**Collective investment securities:** share certificates or any evidence of investor interest in an institution for collective investment, such as mutual funds.	. Local purchases by nonresidents . Sale/issue abroad by residents	. Sale/issue locally by nonresidents . Purchase abroad by residents
	II. Derivatives and other instruments: other negotiable instruments and nonsecuritised claims not covered under I.	. Local purchases by nonresidents . Sale/issue abroad by residents	. Sale/issue locally by nonresidents . Purchase abroad by residents
	III. Credit operations	. Local purchases by nonresidents . Sale/issue abroad by residents	. Sale/issue locally by nonresidents . Purchase abroad by residents
1	Commercial credits		
2	Financial credits		
3	Guarantees, securities, and financial backup facilities		
	IV. Direct investment	. Inward direct investment	. Outward direct investment
	V. Liquidation of direct investment		. limits on repatriation of profits

Table A1 continued: Possible Restrictions on the Financial Sector

VI. Real estate transactions: acquisition of real estate not associated with IV.	. Local purchases by nonresidents	. Sale locally by nonresidents . Purchase abroad by residents
VII. Provisions specific to commercial banks and other credit institutions: regulations that are specific to these institutions, including differential treatment of nonresident deposit accounts and/or deposit accounts in foreign exchange (reserve requirements, liquid asset requirements, interest rate controls, investment regulations, credit controls, open foreign exchange position limits).	. Borrowing abroad . Nonresident deposits	. Maintaince of accounts abroad . Lending to nonresidents . Lending locally in foreign currency
VIII. Provisions specific to institutional investors: such as insurance companies and pension funds and including currency-matching regulations on assets/liabilities composition.	. Limits (max.) on securities issued by nonresidents . Limits(min.) portfolio invested locally	. Limits(max.) portfolio invested abroad
IX. Personal capital movements: including deposits, loans, gifts, endowments, inheritances, legacies, and the settlements of debts abroad by immigrants.	. To residents from nonresidents . Transfer into the country by immigrants	. By residents to nonresidents . Transfer abroad by emigrants
X. Other controls imposed by securities laws: any additional regulations on capital transfers imposed by law.		. Controls on the listing of foreign securities on local markets.
PANEL B: RESTRICTION DOMESTIC FINANCIAL SECTOR		
I. Credit controls:		
1. Directed credit	Preferential loans including directed credit toward favoured sectors or industries, also ceilings on credit toward other sectors.	
2. Reserve requirements	Excessively high reserve requirements are considered restrictive.	
II. Interest rate controls:	. Including whether the government directly controls interest rates, or whether floors, ceilings, or interest rate bands exist. . Policies that introduce new instruments with floating rates are taken as measure that increase interest rate liberalisation.	
III. Entry Barriers:	Including licensing requirements, limits on the participation of foreign banks, and restrictions relating to bank specialisation or the establishment of universal banks. Measures aimed at fostering competition in the financial markets are considered as increased liberalisation.	

Table A1 continued: Possible Restrictions on the Financial Sector

IV.	***Regulation of operations:***	Any operational restriction, such as on staffing, branching, and advertising.
V.	***State ownership:***	Includes financial institutions under special government administration. Measures of privatisation are considered as increased liberalisation.
VI.	***Prudential regulation:***	Any law (e.g. Banking Act) aimed at strengthening the prudential regulation and supervisory powers of the authorities (central bank).
VII.	***Restrictions on securities market***	
	1. Establishment of securities market. 2. Measure to deregulate and strengthen the securties market.	-

Appendix Table A2 Summary of the Various Measures of Financial Liberalisation in the Literature

Author(s)	Description of financial liberalisation measure	Comments
IMF's AREAER [Rules-based]	Generates a 0-1 indicator (0 means always restricted, 1 means never restricted) of the existence of rules or restrictions that inhibit cross-border capital flows or discriminate on the basis of citizenship or residence of transacting agents. Available for all IMF member countries over 1967-1995	Prior to 1996 the AREAER reported the 0-1 dummy for 6 categories: bilateral payments arrangements with members and nonmembers, restrictions on payments for current account transactions, restrictions on payments for capital account transactions, import surcharges, advance import deposits, and surrender or repatriation requirements for export proceeds. Changed in the 1997 issue to provide 0-1 dummies on the subcategories of the above 6 groups. The set of categories that reflect the presence of capital controls has expanded to 13 including, for the first time, a distinction between restrictions on inflows and restrictions on outflows. Others used averages of the 0-1 dummies across the various categories (Johnston and Tamirisa, 1998; Rossi, 1999; and Minia*ne, 2004), others used the sum over different categories (Brune et al.*, 2001).
Quinn, D., (1997) [Rules-based]	***International financial liberalisation index*:** Measures the extent of a country's restrictions on the flow of international finance using the detailed text of the IMF's AREAER. Capital account openness is scored on a graduating 0-4 scale, current account openness on a 0-8 scale, and international agreements on a 0-2 scale, where the larger number represents more liberalized. The resulting 0-14 range indicator is an overall measure of the intensity of international financial liberalisation. Quinn constructed the index for 1950–97 for 21 OECD countries and for the years 1959, 1973, 1982, 1988, 1997 for 43 developing countries.	Note that Quinn, by using a graduating scale (increments of 0.5) to reflect the severity of restrictions, introduces a degree of subjectivity. Quinn deals with this by having two independent coders and then rectifying the differences. One of the most widely used indicators. Also, in Quinn and Inclan (1997b), Quinn and Toyoda (2003), and Quinn (2003), and many others since. Only available up to 1997 since it is questionable whether the pre-1996 editions of the AREAER contain enough text information to make disaggregation comparable to the post-1996.
Montiel, P. and C. Reinhart, (1999) [Rules-based]	**Capital account Liberalisation Intensity Index**, combines the IMF's AREAER indicator with country-specific information (annual reports of country's central bank) to construct an index capturing the intensity of capital controls. Takes on values 0, 1 or 2, with a higher number represents stronger capital account restrictions. Available for 15 emerging economics over 1990-96.	"… an improvement over the straight IMF indicators, it is still extremely general, and does not capture the subtleties of actual capital restrictions" (Edwards 1999). "… over the period 1990–96, there would be little difference between using the range of values 0, 1, and 2, or using only 0 and 1" (Edison *et al.* 2004).

Table A2 continued: A Summary of the Various Measures of Financial Liberalisation

Grilli and M. Milesi-Ferretti (1995) [Rules-based]	**Share indicator:** uses the summary line of IMF's AREAER to measure the proportion of years the country's capital account is reported as free of restrictions. The resulting variable is a 0,1 indicator of the presence or absence of capital controls.	Has been used in many other studies including Rodrik (1998) and Klein and Olivei (1999).
Kraay, Aart, (1998) [Outcome-based]	**Capital account openness:** uses data on actual capital inflows and outflows (the sum of the inward and outward foreign direct investment, portfolio investment and other investment items in the financial account of the balance of payments) as a percentage of GDP.	Analogous to using trade volumes as a measure of trade openness. Others have used portfolio and direct investment assets and liabilities as a percentage of GDP as a indicator of financial openness (Lane and Milesi-Ferretti, 2001; IMF, 2001; O'Donnell, 2001; Edison *et al.* 2002; Chanda, 2005).
Bekaert G., and C. Harvey, (2000) [Rules-based]	**Equity market liberalisation indicators**- three 0-1 dummy variables: *Official Equity Market Liberalisation index*, which reflects chronologically any regulatory change after which investors officially have the opportunity to invest in the domestic equity market. The variable takes the value of one when it the event makes is possible for foreign portfolio investors to own the equity of the particular market and zero otherwise. The second is based on break points in capital flows, estimated through a regime-switching model based on the time series of net U.S. capital flows. *First Sign*: the earliest of three possibilities: a launching of a country fund, an American Depositary Receipt (ADR) or announcement of Official Liberalisation.	Originally constructed for Argentina, Brazil, Chile, Colombia, Greece, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Portugal, Taiwan, Thailand, Turkey, Venezuela, Zimbabwe. Extended by Bekaert *et al. (2004)*to 95 countries. A similar measure has been used by Bekaert (1995), Levine and Zervos (1998), Henry (2000a,b) and Bekaert *et al.* (2001). The chronological of Important Financial, Economic and Political Events are available at http://www.duke.edu/~charvey/Country_risk/chronology/chronology_index.htm
Edison and Warnock (2003) [Outcome-based]	**Capital account Liberalisation Intensity Index:** 1 minus the ratio of the market capitalisation of the constituent firms comprising the IFC Investable index to those that comprise the IFC Global index for each country. The IFC Global index is designed to represent the overall market portfolio for each country, whereas the IFC Investable index represents the portion of domestic equities that are available to foreign investors. A ratio of 1 indicates that all of the stocks are available to foreign investors.	Constructed for 29 emerging market economies. A similar measure has been used by Bekaert (1995), Henry (2000a,b), Bacchetta and van Wincoop (2000), and Aherane *et al.* (2004).

Table A2 continued: A Summary of the Various Measures of Financial Liberalisation

Bandiera *et al.* (2000) [Rules-based]	**Financial liberalisation index:**- the combination (principal component analysis) of 8 dummy variables representing the various dimensions of liberalisation: **Domestic financial liberalisation**: interest rates, pro-competition measures, reserve requirements, directed credit, banks' ownership, prudential regulation **International financial liberalisation** - capital account and exchange rate liberalisation.	Similar measure used in Laeven (2003).
Kaminsky and Schmukler (2002) [Rules-based]	**Financial liberalisation index:**-average of the two indices below. **Domestic financial liberalisation**: focus on interest rate regulations and complement with information on the regulations reserve requirements, credit allocation and foreign currency deposits. **Capital account liberalisation:** regulations on offshore borrowing by domestic financial institutions, offshore borrowing by non-financial corporations, multiple exchange rate markets, and controls on capital outflows.	The criteria for classification are: fully liberalised if 1)There are no controls (ceilings and floors) on interest rates, and 2) There are likely no credit controls and deposits in foreign currencies are likely permitted. Partially liberalised if there are controls in either lending or borrowing rates (ceilings or floors) and maybe controls on 2. Repressive if there are controls in lending rates and borrowing rates (ceilings and floors) and likely to be controls on 2.
Demirguc-Kunt and Detragiache (1998) [Rules-based]	**Domestic financial liberalisation:** Use the first date in which some interest rates were liberalised create a dummy variable with zeros for periods in which interest rates are subject to controls and ones for the liberalised periods.	Constructed for 53 developing countries.
Abiad and Mody (2005) [Rules-based]	**Financial liberalisation index:**-aggregation of six dimensions: directed credit/reserve requirements; interest rate controls; entry barriers and/or lack of pro-competition policies; restrictive operational regulations; the degree of privatization in the financial sector; and controls on international financial transactions.	For each dimension, a country is given a score on a graded scale, with zero corresponding to being fully repressed, one to partially repressed, two to largely liberalized, and three to fully liberalised.

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