FINANCE AND REAL DEVELOPMENT IN THE CARIBBEAN

Edited by
ANTHONY BIRCHWOOD
and
DAVE SEERATTAN

CARIBBEAN CENTRE FOR MONETARY STUDIES
The University of the West Indies
St. Augustine, Trinidad, Republic of Trinidad and Tobago

FINANCE AND REAL DEVELOPMENT IN THE CARIBBEAN

Published by
CARIBBEAN CENTRE FOR MONETARY STUDIES
The University of the West Indies
St. Augustine, Trinidad, Republic of Trinidad and Tobago

ISBN: 978-976-8188-09-X

FINANCE AND REAL DEVELOPMENT IN THE CARIBBEAN

Edited by: Anthony Birchwood and
Dave Seerattan

Published by the
Caribbean Centre for Monetary Studies
The University of the West Indies
St. Augustine, Trinidad
Republic of Trinidad and Tobago

ISBN: 978-976-8188-09-X

Table of Contents

Table of Contents - Cont'd

Table of Contents - Concluded

Preface

Since 1969, The Caribbean Centre for Monetary Studies (formally the Regional Program of Monetary Studies) has been hosting the Annual Monetary Studies Conference in various CARICOM territories. The Conference is targeted at central bank practitioners and academics, with the primary focus being the field of money, finance and development economics. Over the years, the conference has attracted scholars of regional and international appeal, with expertise in a wide cross-section of areas that are particularly relevant to the Caribbean and other developing countries.

The studies in this book were selected from the Annual Monetary Studies Conferences held over the period 2001 to 2003, after a rigorous double-blind refereeing process. Consisting of 24 papers, the studies cover a wide range of topics that are relevant to developing countries. For convenience, the studies are divided into seven sections, namely: Macroeconomic Dynamics of the CARICOM States; Financing Growth in the Caribbean; An Examination of Special Sectors in the Caribbean; Currency Risk and Prices; Financial Markets; Emerging Trade Issues and Economic Governance of Caribbean Countries. However, as is invariably the case in economics, all sections are deeply interrelated.

The publication comes at a critical juncture as the economies in the Caribbean face the burden of finding the right policy mix in order to achieve sustainable economic growth and development in a fast-paced changing global environment. Influenced largely by differences in economic structure, the evolution of the regional economies has reflected a heterodoxy of economic policies among the various economies. Nevertheless, the economies all strive to achieve diversification, build markets, find the right prices and grapple with trade issues. It is hoped, therefore, that scholarly works such as those contained in this book may serve to illuminate intellectual thought on the subject of economic development in small emerging markets.

Production of this book could not have been realized without the kind assistance of others. We would like to thank all the individuals who presented papers at the various conferences. The papers all contributed towards the advancement of economic knowledge in the region. High praise must also be extended to the referees who volunteered their time towards ensuring that the selected papers met scholarly standards. We also owe the deepest gratitude to Professor Ramesh Ramsaran, the Acting Executive Director of the Centre, for ensuring that the publication became a reality. Thanks must also be extended to Ms Savitri Pargass who was largely responsible for language editing and proofreading and to Mrs. Gloria Lawrence who typeset the monograph. Of course, all remaining errors are ours.

Anthony Birchwood, Research Fellow
Dave Seerattan, Research Fellow.

List of Contributors

Anand Persaud is a Lecturer at the University of Guyana.

Anston Rambarran is the Research Manager at the Caribbean Money Market Brokers), Trinidad and Tobago.

Anthony Birchwood is a Research Fellow at the Caribbean Centre for Monetary Studies, The University of the West Indies, Trinidad.

Carl Howell is an Economist at the Caribbean Development Bank, Barbados.

Courtney Blackman is an International Consultant.

Daniel Boamah is the Director of Research at the Central Bank of Barbados.

Dave Seerattan is a Research Fellow at the Caribbean Centre for Monetary Studies, The University of the West Indies, Trinidad.

DeLisle Worrell is a Senior Economist at the Monetary and Financial Systems Department, IMF.

Derick Boyd is a Senior Lecturer at the University of East London.

Elmer Harris is an Economist at the Caribbean Development Bank, Barbados.

Elvan Kayral-Morris is a Senior Research Officer at the Research Department, Bank of The Bahamas.

Esteban Peréz is Coordinator at the Economics Unit, ECLAC Subregional Headquarters for the Caribbean.

Gobind Ganga is Deputy Governor at the Bank of Guyana.

Ian Durant is an Economist at the Caribbean Development Bank, Barbados.

Janice Christopher-Nicholls is the Manager of Research at the Trinidad and Tobago Unit Trust Corporation.

Karl Bennett is Professor Emeritus at the Department of Economics, University of Waterloo.

Karen P. Williams is Deputy Director of Statistics at the Eastern Caribbean Central Bank.

Kevin Finch is an Economist at the Central Bank of Trinidad and Tobago.

Kevin Greenidge is a Senior Economist at the Central Bank of Barbados.

Lavern McFarlane is an Economist at the Bank of Jamaica.

Leslie Ann De Vignes is an Economist at the Central Bank of Trinidad and Tobago.

Marco Petracco is a Research Economist at the Caribbean Development Bank.

Marion Williams is Governor at the Central Bank of Barbados.

Natasha N. Marquez is Regional Debt Advisor at the Commonwealth Secretariat.

Patricia Welsh-Haynes is Deputy Director at the Banking and Monetary Operations in the Eastern Caribbean Central Bank.

Patrick Kendall is a Research Economist at the Caribbean Development Bank.

Ramesh Chaitoo is a Services Trade Specialist at the Caribbean Regional Negotiating Machinery.

Ryan Skeete is an Economist at the Central Bank of Barbados.

Roland Graigwell is Chief Economist at the Research Department in the Central Bank of Barbados.

Ron Smith is a Professor at Birkbeck at Birkbeck College at the University of London College, University of London

Suzette Hudson is a Senior Economist at the Economic Programming Division, Bank of Jamaica.

Tarron Khemraj is a Research Associate at the Bernard Schwartz Centre for Economic Policy Analysis, New York.

Vanus James is Honorary Senior Research Fellow at the School for Graduate Studies and Research, The University of the West Indies Mona, Jamaica.

Winston Moore is a Lecturer at Cave Hill Campus, The University of the West Indies, Cave Hill, Barbados.

Xiomara Archibald is an Economist at the Barbados Central Bank.

Section A:
Macroeconomic Dynamics of the CARICOM States

1

Import Productivity Growth, Capital Deepening and Caribbean Development: Some Theoretical Insights

Vanus James[1]

Abstract

This paper follows up suggestions long ignored in the Caribbean literature that growth of import productivity is the key to growth of output per capita in a Caribbean economy, and develops some basic proposals on how such productivity growth might be achieved. Capital is treated as produced means of production and human and social capital are introduced into the model through the labour input rather than through the disaggregation of the capital input. The results suggest that there are considerable non-linear factors by which import productivity growth is likely to be optimized. These factors include (1) a through relatively faster rate of growth of investment in domestic physical capital per unit of imports than in the import intensive sector and (2) a relatively faster growth of investment in human capital to support this form of capital deepening. F3; F4

Introduction

This paper follows up long ignored suggestions in the Caribbean literature that growth of the productivity of use of foreign exchange is the key to growth of output per capita in a Caribbean economy and that domestic capital is the central contributor to the process. For convenience, the productivity of use of foreign exchange in production is referred to simply as

1 E-mail address: jamesvj@hotmail.com

import productivity. In the spirit of reawakening interest in combining theory and empirical economic analysis, the paper seeks to reset the theoretical framework for analyzing the development of production possibilities and productivity by focusing on the role of domestic capital and the associated capacity to adapt and innovate.

True development requires growth of resource productivity accompanied by externalities and income redistribution and other adjustments that are meaningful aspects of the opportunity for an improving quality of life. In the long run domestic capital formation, and in particular domestic capital deepening, is the basis of all these ideas. However the role of capital has not been adequately studied for Caribbean economies, less because of measurement difficulties and more because of social failure to formulate and adopt a systematic and structural approach to the issue. While, under the influence of OECD thinking, attention has been devoted to labour productivity and education, while there has been neglect of import productivity and the joint role of other domestic physical and institutional capital. As a result, the role of education itself has been too narrowly conceived.

The paper assumes the usual open economy, still grappling with the problem of development and commercial utilization of its domestic capital forms and with import-intensive production, the speed of work, and the limits set on demand by the balance of payments on domestic consumption and employment, and ultimately on capital production and accumulation. There are two broadly defined sectors. One (sector a) makes capital (X_a) and is capital intensive in the sense that firms tend to high operating leverage of domestic capital costs in the pursuit of profits. The other, (sector b) uses imported inputs intensively to make X_b, in that it practices high operating leverage of imported inputs in pursuing profits. Further, as in the early traditions set by Lewis (1954, 1964), Demas (1965), Best (1968) and Best and Levitt (1969), and employed more recently by Harris (1997), it is assumed that the binding constraint on growth and transformation is the available supplies of foreign exchange, which one can reasonably treat as a balance of payments problem on the current account.

In a bid to address matters relating to the growth of labour productivity and corrective factor substitution, the Solow-Swan tradition (Solow, 1956; Swan, 1956) was revived with a human capital variable by Mankiw *et. al.* (1992) and more recently it was addressed in the Romer-Lucas endogenous growth models (Romer, 1986, 1990 and 1993; Lucas, 1988). In this study the growth of capital per worker is treated as an endogenous variable, with the saving rate, technical progress and the growth of the labour force (population) treated as exogenous. This type of modelling is now being widely used in the Caribbean, especially in the empirical work on the Caribbean region, neglecting the notion of factor substitution between domestic capital and imported inputs. This paper departs from this trend by reconsidering the forms of capital deepening and the associated key type of resource reallocation that optimizes import productivity growth. These core forms of capital deepening must be specified before it can be determined what are the interesting variables to model endogenously (simultaneously) and how to model them.

In this regard, two changes are employed in the approach to derivation of the rate of return that accrues through productivity growth. First, domestic capital, import capacity and human capital are separately accounted for in the model of import productivity. In addition, the character of capital as an output produced in the domestic economy is incorporated into the standard model so that not all inputs are treated as primary. Second, human and social capital are introduced into the model through the effective labour input rather than through the disaggregation of the capital input to avoid potential logical fallacies about how the return on physical capital, the return on human capital and the wage are linked. The key implication to be noted by analysts is that the results suggest that there are considerable nonlinearities that are likely to exist in the parameters and processes that drive real economic development and that these must be captured by appropriate nonlinear approaches to analysing many aspects of Caribbean economic dynamics.

In general, the results replicate the usual roles for the terms of trade adjusted by the share of imports in total GDP, the rate of deepening of imported inputs per worker, the rate of growth of the employment rate, and the rate of growth of the labour force participation rate, all of which are central to both the Solow-Swan tradition and the Romer-Lucas endogenous growth models. However, it is shown that the important form of capital deepening is the growth of appropriate domestic human and non-human capital per unit of imported productive inputs, rather than the growth of imported capital per worker. Further, growth of import capacity and hence improvement in the standard of living are optimized when import capacity and other associated resources are shifted to the capital-producing sector even though the economy should exploit all of the advantages of high labour productivity in sectors that make intensive use of imports. The required shift of resources will not simply occur through the market and there is substantial room for policy intervention. Of particular importance, keeping in mind the industrial character of the capital development process and the associated need for investors to rely on significant external financing, the transfer of resources to reconstruct comparative advantage in the manner described also requires development of suitable financial systems that are competent to shunt import capacity from the low-import-productivity sectors to the high import productivity sectors. This has generally been the experience with education, for example. The limited success of Caribbean countries in developing a sufficient range of appropriate financial institutions to achieve the desired reallocation is quite costly in terms of lost opportunities to raise the standard of living.

Growth of Per Capita Income and Import Productivity

It is assumed that the binding constraint on growth and transformation of any Caribbean economy is the available supplies of foreign exchange, which one can reasonably treat as a balance of (international) payments problem on the current account (Demas, 1965:4; McCombie and Thirlwall, 1994; de Benedictis, 1998). This constraint was actually first fully specified for Caribbean economies by Best (1968) and Best and Levitt (1969), who labelled it as the import capacity constraint. In general, the idea represented was that in the absence of an international currency that allowed the society to borrow unlimited supplies of

imports interest free, plans by firms, sectors and the economy must give priority to the problem of how to access a definite supply of foreign currency (yielded by exports and other sources) to procure imports - a capacity to import- that must be leveraged to create surplus, make profits and raise the standard of living. The concept of a limited capacity to import is much the same as a binding balance of payments constraint on the current account. The crucial question is: what are the broad guidelines that economic analysis suggests about how this problem will be solved along the path of rising per capita income and general development? What socio-political and economic restructuring would have to drive the growth of per capita income during the period of imbalance when there is significant dependence on unrequited capital transfers and net inflows of private commercial capital?

The germ of this idea was formulated by Lewis (1950; 1954; 1964) who warned repeatedly that over-investment in imported machinery and equipment is perhaps the fundamental cause of the economic problems of Caribbean economies, including poverty. Lewis saw this as the form of resource misallocation ultimately responsible for the inefficiencies of the firms, sectors and economy, for misaligning the exchange rate and for limiting public policy options. His proposals for import substitution were aimed primarily at correcting this misallocation problem by employing relatively more local inputs, especially the available abundant supplies of labour.

Demas (1965:4) saw that for a country to get to the point where it could achieve "continued economic growth by relying on its own domestic savings to finance its domestic investment," it would first, or in the process, have to achieve "balance ... in the international accounts ... without resort to net capital exports." Apart from the requirement that it is necessary to generate sufficient domestic savings, pending arrival at the stage where such savings become a binding constraint and the current account ceases to be, Demas (1965:8) specified a comprehensive set of "transformations" that would be needed to drive the growth of per capita income during the period of imbalance when there is significant dependence on unrequited capital transfers and net inflows of private commercial capital. These are the capacity to transform as determined by political and social processes and attitudes; the unification of the national markets for goods and services; the shift of the structure of production and of labour as between the primary, secondary and tertiary sectors of the economy; the development of an increasing degree of interdependence among domestic industries and activities; changes in the importance of foreign trade; the reduction of dualism; and the development of appropriate institutions.

More recently, the constraint was explicitly recognized by Harris (1997:1-2), in the observation that with respect to Jamaica "the import capacity of the economy ... is a basic factor governing the economy's productive capacity and growth potential." In the National Industrial Policy of Jamaica, 1996, designed under Harris's technical leadership, it was argued that the solutions to this constraints are: (a) export push, through building and sustaining targeted areas of competitive advantage in the national economy, and (b) efficient import substitution, consistent with the focus on international competitiveness as the key element of the policy (GOJ (1996:4). However, focus on export growth and efficiency of import substitution does not take into account the extent to which these solutions depend on prior or

current investment in education, democratisation and other forms of domestic capital (Wood, 1994).

An appropriate refinement of all these insights and arguments is that the encompassing solution is continuous economy-wide import productivity growth, including in production for exports. The trend in the standard of living of Caribbean countries is certain to be strongly correlated with the productivity of use of import capacity and as the growth of import productivity goes, so goes that improvement of the standard of living. So, a basic economic and social question facing a Caribbean economy is that of how to achieve import productivity growth even as the quality of imported productive inputs improves in the context of ongoing technological change in the OECD.

In Caribbean countries, firms and sectors involved in import substitution or traditional exports such as sugar, oil and bauxite have a long tradition of relying primarily on adoption of imported new OECD technologies for their long-term profitability and local or export market successes. Since most of these advances of technologies are the result of deliberate and strategic commitment and channelling if resources to R&D in the OECD, and to the implementation of issues involved in getting products to market, they are also skills-biased and lead correspondingly to a rapid increase in labour productivity in adopting firms and sectors in the Caribbean. However, that also implies a high degree of operating leverage of imported inputs and foreign exchange-sensitive costs at the level of the firm along with recreation of repeated current account balance of payments problems at the level of the economy. It follows that deliberate domestic commitment and management of resources to adapting imported inputs in order to increase the productivity of these leveraged imported resources are what would most effectively and simultaneously cut unit costs, lower the risk of investment (by lowering the variability of profits as output varies) and raise competitiveness. Domestic capital-intensive firms tend to operate differently, relying on creativity and high and rising import productivity for market penetration and profitability. In general, for the system as a whole, and for the sectors that are highly import-leveraged, the general implication is that import productivity growth would provide the vital long-term basis for simultaneously expanding and transforming exports, cutting costs and saving of foreign exchange, and ultimately for increasing real income per capita.

In general then, since all inputs combine with technological change to influence output, the level and quality of private and public domestic capital inputs as well as the level of quality of human and institutional capital embodied in labour will also impact import productivity growth. To integrate these ideas into the analysis of real per capita income (υ) , it is appropriate to write the real per capita income of a country as the multiplicative identity

$$1. \qquad \upsilon = \frac{Py_m}{d} m_k k n \eta$$

where y_m is import productivity, m_k is productive imports per unit of domestic capital, k is the value of capital per worker, n is the employment rate, η is the

labour force participation rate, and P is the index of the prices of output used in calculating υ. The variable d is a composite GDP deflator reflecting cost of living changes and changes in the price of capital inputs. In an open economy such as that of the Caribbean, value is added to imports, capital and labour, so in estimation of the GDP from the expenditure side, there are prices for domestic output and prices for imports since domestic absorption comprises imports and domestic output. From the side of value added, wages and profits are specified in terms of domestic prices, including those for produced means of production, while returns to imports feature import prices. Thus, the analytical deflator used to specify real income must necessarily be devised to represent both types of commodities. The deflator could therefore be represented as a mean of domestic and foreign prices P^*, with proportional weights λ on domestic commodities and $(1-\lambda)$ on imported commodities in total absorption. The choice of the geometric mean by ul Haque (1995) is a mathematical convenience. Set,

$$2. \qquad d = P^{\lambda} P^{*(1-\lambda)}.$$

Now, note that $P^* = \varepsilon P_f$ where ε is the exchange rate in local dollars per unit of foreign and P_f is the landed (CIF) price in foreign dollars. Using (2) in (1) and taking logs and differentiating the result with respect to time, make it evident that

$$3. \qquad \frac{d\upsilon}{\upsilon} = (1-\lambda)[\frac{dP}{P} - \frac{d\varepsilon}{\varepsilon} - \frac{dP_f}{P_f}] + \frac{dy_m}{y_m} + \frac{dm_k}{m_k} + \frac{dk}{k} + \frac{dn}{n} + \frac{d\eta}{\eta} \quad .$$

By (3), the long-run growth of per capita real income is determined partly by growth of the productivity of imports which is to say on the saving of foreign exchange, the rate of change of the terms of trade itself multiplied by the share of imports in total GDP as well as the variables, the rate of growth of domestic capital per worker, the rate of growth of the employment rate, and the rate of growth of the labour force participation rate, that are central to both the Solow tradition and the endogenous growth models in the newer tradition of Romer. The issue of the growth of capital per unit of imports is still to be clarified and it will turn out that under Caribbean conditions the lower m_k will cause a higher y_m and thus a higher υ. The weight on the growth of the terms of trade implies that as the share of domestic consumption (and hence domestic output) rises, the smaller will be the influence of changes in the terms of trade on the growth of per capita income (ul Haque, 1995).

To examine $\frac{dy_m}{y_m}$, one normally considers the production possibilities frontier. Assume a simple multiplicative production function, with inputs of capital (K), labour (L) and imported inputs (M). The partial productivities, whether labour, capital or imports, are incomplete, so it is necessary to incorporate an index (A) that captures the joint influence on output (and productivity) of all other externalities, including the average level of education and democracy in society, that are not accounted for by the mere scale-up of individual factor inputs.[2] It is also consistent with standard practice to start by capturing the constraining role of the capacity to import by initially assuming convexity, so that despite the presence of diminishing returns to specific fixed factors countries with a higher capacity to import can grow faster, whatever their experience with structural transformation. Associate the powers α and β with capital and labour respectively, and write

$$\gamma = 1 - \alpha - \beta \,. \tag{4.}$$

If all factor inputs are usually assumed to be "primary" to the economy in the sense of being available to, but are not "produced" in it, then, the output rate can be given by

$$Y = AK^{\alpha}L^{\beta}M^{1-\alpha-\beta} \tag{5.}$$

Where y is output and import productivity is

$$y_m = \frac{Y}{M} = A(\frac{K}{M})^{\alpha}(\frac{L}{M})^{\beta} \,. \tag{6.}$$

The view in (6) of the possibilities for raising competitiveness is important in its own right. It focuses on raising the productivity of imports, which is to say on saving foreign exchange, and indicates that this can also be done by raising total factor productivity, conceived as the overall accrual of productivity benefits to firms from technological improvements and efficiencies that are occurring by altering the nature of production and processes while also scaling up domestic capital per unit of imports or increasing employment per unit of imports in some combination.

Now, among the limitations of (5) and therefore (6), are that $\alpha + \beta + \gamma = 1$ and that K is assumed to be a primary factor input. Customarily, economists get around the unitary elasticity by turning to various other reasonable specifications of the constant elasticity of substitution (CES) function, the transcendental

---

2 It represents the value of output when $K = L = M = 1$ and, if necessary, could be disaggregated to isolate and make endogenous the effects of mean years of schooling.

logarithmic production (translog) function, the CES-translog function, the generalized Leontief production function, and even the Harrod production function, among other devices (Chung, 1994). To address the weakness of the assumption that K is all primary and physical, as well as to incorporate the implicit Romer-Lucas critique of Solow, Mankiw, Romer and Weil (1992) disaggregated K to introduce human capital as an explicit input without having to address the prospects of perpetual long run growth through increasing returns. Capital, however, remains a primary factor input. Instead of turning to these devices, we draw insight from the Leontief and Harrod functions to think about the nature and role of capital and later the distinctions that must be drawn between the production functions of sector a and sector b.

What exactly does capital mean? The appropriate answer used in the Leontief production function is that, rather than being a primary input, capital is a domestic output that is used as an input.[3] Then, considering a long enough time-scale for adjustment of K and M to meet the existing challenges of competition, it is necessary to write a simultaneous-equation production model instead of only (6).

Assume that total non-educational-institutional capital is related to total current output by a simple (minimal) technical coefficient whose value depends on the time scale over which K is counted and so accommodates possibilities of technological change. So that K can either be a pure current flow, as in circulating capital models, or include a stock of various vintages accumulated over a longer period. The result is a capital-output relation of the form,

$$7. \qquad K = v_{ky}(t)Y \, .$$

After substituting (7) into (5) and ignoring the time index for convenience, the production model becomes

$$8. \qquad Y = [A v_{ky}^{\alpha} L^{\beta} M^{1-\alpha-\beta}]^{\frac{1}{1-\alpha}}$$

for $\alpha \neq 1$. So that,

$$9. \qquad y_m{}^{(1-\alpha)} = A(\frac{v_{ky}}{M})^{\alpha}(\frac{L}{M})^{\beta}$$

or

---

3 Recognition of this introduces the circularity and roundaboutness of production that is the foundation of cumulative causation - with one sector using the output of another, then generating output that is used by a third, and so on, setting up a multiplier process that causes the productivity of the initial capital output to grow well beyond what it would be in the absence of such causation.

$$10. \qquad y_m = A^{\frac{1}{1-\alpha}}(\frac{v_{ky}}{M})^{\frac{\alpha}{1-\alpha}}(\frac{L}{M})^{\frac{\beta}{1-\alpha}}$$

It is immediately obvious from considering the exponents of (8) that as domestic capital now enters the model, the restriction of unitary elasticity disappears, since the sum of exponents of the factor inputs is $\frac{\alpha+\beta+\gamma}{1-\alpha} = \frac{1}{1-\alpha} \neq 1$. Moreover, it is no longer true that $Y = A$ when $K = L = M = 1$. In general, the model admits to the presence of increasing returns whose extent of increasing returns grows as $\alpha \to 1$. Moreover, the externalities of A are not the sole source of increasing returns but could fully capture the role of the average level of human capital in Lucas (1988) as well as the role of "non-rivalrous inputs" gleaned from the rest of the world through imported technologies in Romer (1990).

It is now possible to introduce the key issue of the efficiency of labour (ϕ) raised by Best (1975). A crucial variable in (6) is $\frac{N}{M}$, the focus of Lewis' (1954, 1964) thesis when N is the number of workers. Lewis showed that the problem of sectoral and resource imbalances and ultimately unemployment of labour must be understood in terms of the over-investment in imported machinery relative to the number of workers - an $\frac{L}{M}$ ratio that is too low to solve the problems of underdevelopment in a Caribbean economy, especially the problems of the balance of payments. In a two-factor model in which all capital is essentially in the form of M, Lewis's finding remains compelling when L is interpreted as work rather than workers.

However, in a three-factor and two-commodity world, it is not necessarily a disadvantage to have low $\frac{L}{M}$ when L means labour, measured as the number of effective workers. In such a case, a low $\frac{L}{M}$ can be the source of the strategic advantages of one sector but can be over-compensated by a very high $\frac{K}{M}$ ratio in order that $\frac{Y}{M}$ can be sufficiently high to slacken the binding M constraint and make both K and local saving binding, thus making the Lewis result very special. Note here that a sufficiently high $\frac{K}{M}$ ratio would then make both K and M responsive to price stimuli, with particular regard to the exchange rate and the rate of interest, and thus to routine price-based (exchange-rate-based and interest-rate-based) policy management. This clarifies the principle advanced above that a lower m_k, which is simply the reciprocal of $\frac{K}{M}$, will cause a higher y_m. In any event, as Best (1975) argued, we must really be interested in L as work and the overall national condition of a high $\frac{L}{M}$ combined with any given $\frac{N}{M}$ as one of the strategic conditions of Caribbean development. The difference is made by the condition that a high $\frac{L}{M}$ must also imply a high speed of work, or if

you like, the embodiment of a lot of suitable domestic human and social capital in the available supply of workers.

To treat L as work delivered within firms, the socio-technical data must indicate the need for so many workers for a period, delivering a corresponding flow of work linked to the disposition of hearts and minds (Best, 1968, 1975; Hamilton, 1994; James, 1993, 1994). So, it is necessary to account for the effective (or equivalent) number of basic workers made available through efficiency by the actual number of workers (N) actually hired. Let ϕ be the time-based index of the weighted average flow of work per worker, benchmarked on a "worst worker" using the available technology and embodying appropriate human and social (institutional) capital. The larger is ϕ, the more the effective number of workers that are embodied in any given number of employees. It is then appropriate to write

$$11. \qquad L(t) = \phi(t)N(t)$$

to distinguish the number of workers from the flow and hence the quality of work and exhibit employment explicitly. This ultimately implies that, as one of the strategic conditions of Caribbean development, it is necessary to be concerned with an overall high $\frac{L}{M}$ combined with a low $\frac{N}{M}$, achieved by investment in appropriate educational and social capital. In that sense, the difference from Lewis is achieved by the condition that a high $\frac{K}{M}$ must also imply a high efficiency of labour and therefore a high value for ϕ. Then, we get the productivity of imports as

$$12. \qquad y_m = A^{\frac{1}{1-\alpha}}\left(\frac{v_{ky}}{M}\right)^{\frac{\alpha}{1-\alpha}}\phi^{\frac{\beta}{1-\alpha}}\left(\frac{N}{M}\right)^{\frac{\beta}{1-\alpha}}.$$

The equation suggests that productivity growth is a nonlinear process reflecting the significance of increasing returns as the level of technical interdependence among the users and producers of capital grows and as various factor-intensities adjust along with the efficiency of labour.

Productivity Growth

Specifically, since $\frac{v_{ky}}{M} = \frac{K}{MY}$, equation (12) gives rise to

$$13. \qquad \frac{dy_m}{y_m} = \frac{1}{1-\alpha}\frac{dA}{A} + \frac{\beta}{1-\alpha}\left(\frac{d\phi}{\phi} + \frac{dN}{N} - \frac{dM}{M}\right) + \left(\frac{\alpha}{1-\alpha} - 1\right)\left(\frac{dK}{K} - \frac{dM}{M} - \frac{dY}{Y}\right) + \frac{dY}{Y}.$$

The relevance of the rate of growth of imports in (13) would make it immediately important to consider adding to the set of endogenous variables of a complete model the propensity to import as an endogenous function of the productivity of imports.

If the third and fourth terms of (13), $(\frac{\alpha}{1-\alpha}-1)(\frac{dK}{K}-\frac{dM}{M}-\frac{dY}{Y})+\frac{dY}{Y}$, are dropped as a result of abandoning the concern with domestic physical capital, and if it is also assumed that the efficiency of labour is fixed so that $\frac{d\phi}{\phi}=0$, then the result is essentially the Lewis model of import productivity growth that would address the concern with over-investment in foreign capital and the solution of that problem by expanding domestic employment. Retention of the third and fourth terms, and assuming that $\frac{d\phi}{\phi}\neq 0$, expands the model of productivity growth to consider the concerns of Best (1971a, 1971b) and Demas (1965).

The concept of growing import productivity in (13) formalises Best and Levitt's (1969) idea of import displacement, but without any suggestion of the reduction of imports to achieve viability. Best's (1971) formulation of the arguments placed squarely on the table the role of what is called today total factor productivity growth - the development of independent thought, technological and organizational improvements in the workplace, institutional progress, democratization and the development of social self-esteem, improved sectoral balance and resource allocation and a variety of other matters - some of which arise from indigenous adaptations and innovations (effected by the domestic innovation system) and some of which arise as adopted spillovers.

Summarily, to achieve import productivity growth, it is possible to improve total factor productivity, accumulate capital by increasing its output as a share of GDP and imported inputs, and raise the efficiency of labour or increase employment per unit of imported inputs. Raising employment could be obtained by using labour intensive methods, but raising the efficiency of labour is about increasing training and other human capital, which is one of the sources of the increase in $\frac{K}{M}$.

Increasing Returns

With $0<\alpha<1$, the equation indicates the existence of increasing returns to varying degrees, depending on whether one is considering technical progress, capital accumulation and industrial restructuring (the rising share of capital in output) relative to import capacity. This is purely a consequence of the recognition that capital human or non-human is a produced factor input and does not require the usual special assumptions of any particular relation between productivity and output typical of derivations of cumulative causation generally and the Verdoorn law in particular (Myrdal, 1957; Kaldor, 1966, 1967; De Benedictis, 1998:254,274). Moreover, an appropriate version of the Verdoorn Laws themselves is directly implied by (13). In particular, by the term $(\frac{\alpha}{1-\alpha}-1)(\frac{dK}{K}-\frac{dM}{M}-\frac{dY}{Y})$ and the independent role of the growth of output $\frac{dY}{Y}$, the relationship between the growth of production and productivity takes the form that if total output is growing under

conditions such that the output of domestic capital per unit of import capacity grows relative to output and domestic capital grows relative to import capacity, then import productivity will grow.

Thus, under conditions when output is growing ($\frac{dY}{Y} > 0$), increasing returns are linked directly to the growth of capital per unit of import capacity relative to output and growth of capital relative to import capacity, since a positive impact of the second term requires that $\frac{dK}{K} > \frac{dM}{M} + \frac{dY}{Y}$ or more usefully that $(\frac{dK}{K} - \frac{dY}{Y}) > \frac{dM}{M}$, so that industrial restructuring is occurring at the same time as the structure of factor employment. Put differently, this is a version of the Verdoorn process which indicates that cumulative and circular causation is not merely about output growth but about industrial restructuring, domestic capital accumulation and factor-intensity reversal in the broad sense identified by Demas (1965). Of course, the technical conditions for increasing returns must exist in that domestic capital must exist and $(\frac{\alpha}{1-\alpha} > 1)$ so that $\frac{1}{2} < \alpha < 1$. Under such conditions, increasing returns and cumulative causation are tied to the condition that the growth of output is accompanied by relatively faster growth of domestic capital per unit of import capacity.

Worker Efficiency

In (13), the term $\frac{1}{1-\alpha}\frac{dA}{A}$ characterizes the autonomous growth of import productivity triggered by technological change, democratization of social, political and institutional processes, and such factors. The term $\frac{\beta}{1-\alpha}(\frac{d\phi}{\phi} + \frac{dN}{N} - \frac{dM}{M})$ characterises the contribution of growth of the work flow, and hence the efficiency of labour and the level of employment, relative to imports along the lines of Lewis (1954) and Best (1968; 1975). It yields a positive impact on import productivity growth if $\frac{d\phi}{\phi} + \frac{dN}{N} > \frac{dM}{M}$. So, even if the efficiency of labour does not grow, the productivity of imports can grow as long as employment grows, which is Lewis's condition. The more interesting condition ultimately attributable to Best (1975) is that the economy would experience transformational growth of productivity if the efficiency of labour grows through development and employment of domestic capital. When this result is combined with Lewis's condition, the more powerful and more general result is that the economy does much better in that it would both grow and transform due to capital employment if both the efficiency of labour and the level of employment grow.

A problem which arises with respect to the empirical investigation of the speed of work, is that it is very difficult to measure the efficiency of labour in firms with available data and in particular without extensive motion-and-time studies. To grapple with this problem, we suggest that one should consider the relation of the flow of work with investment in human and institutional capital, which is measurable. This serves to extend both the traditional integration of human capital theory into productivity modelling as well as to bring the insightful formulations of Nell (1988) into the story. Human knowledge, current or traditional,

and institutional arrangements capital are always partially embodied in workers who are becoming increasingly knowledgeable and flexible, and who are sharing these characteristics formally as well as through social interaction in communities and on the job (McMahon, 1999:6). Two propositions must be brought together. First, the higher the quantity of human and social capital per worker, the faster (and better in terms of quality) the flow of work. Note that the greater the extent of traditional and current information and the social capital sharing among sub-sectors, the greater the extent of positive externalities and spillovers that would affect the flow of work. This is captured in a rising coefficient of increasing work flow and hence a fall in the actual number of workers needed to deliver any given flow of output. Put differently, it results in increasing social returns to investment in human and social capital. The result is an increasing flow of work per worker, in terms of faster and higher quality work.

We postulate a relation between the output of human and institutional capital per worker (h) and the flow of work from workers, as follows:

$$14. \qquad L(t) = L(t)^{\tau} h$$

with $0 \leq \tau(t) < 1$ a parameter that changes over time with the evolution of human and institutional capital formation and one that relies heavily on N, to one that increasingly pursues displacement of workers as the extent of externalities from education grows. After reorganizing terms, we write

$$15. \qquad L(t) = h(t)^{\frac{1}{1-\tau}}$$

The equation indicates that the flow of work from employed workers in the system, or if one likes, the number of effective units of labour, rises with the growth of human and institutional capital per worker, with the extent being dependent on the coefficient $\tau(h,t)$. As $\tau(t) \to 1$, the greater is the amount of work obtained from any given number of workers - so clearly, $\tau(h,t)$ is a coefficient of increasing work returns to investment in human and institutional capital.[4]

---

4 Note that introduction of the relevant analogue of (15) into any price equation would place major emphasis on the fact that the wage is substantively a payment for capital in workers who receive education through schooling, learning by doing, and so on, and is therefore proportional to the level of human and social capital owned by workers. It suggests a fundamental adjustment to the method of price modelling and, crucially, exhibits the potential nonlinearity of prices as well. That, however, is not the subject of this essay.

Taking logs and then time derivatives of (15), we get

$$16. \qquad \frac{dL(t)}{L(t)} = \frac{1}{1-\tau}\frac{dh}{h}$$

or, dropping the time series indicators,

$$17. \qquad \frac{d\phi}{\phi} + \frac{dN}{N} = \frac{1}{1-\tau}\frac{dh}{h}$$

Substituting from (17) into (13) gives the basic dynamics of the productivity frontier as

$$18. \qquad \frac{dy_m}{y_m} = \frac{1}{1-\alpha}\frac{dA}{A} + \frac{\beta}{1-\alpha}\left(\frac{1}{1-\tau}\frac{dh}{h} - \frac{dM}{M}\right) + \left(\frac{\alpha}{1-\alpha} - 1\right)\left(\frac{dK}{K} - \frac{dM}{M} - \frac{dY}{Y}\right) + \frac{dY}{Y}$$

again with $\frac{1}{2} < \alpha < 1$. Equation (18) suggests that empirical development analysis must depart significantly from the analytical lines of labour productivity growth models and look more closely at the specific roles of all forms of domestic capital relative to imports. The term $\frac{dh}{h}$ indicates that in this formulation human capital per worker is variable and the second and third terms indicate that both human and non-human domestic capital per unit of imports are variable, rather than being fixed as they are in steady state and steady growth models that seek to explain labour productivity growth models. In fact, the expectation is that they are rising in all countries but faster in some (like Barbados perhaps) and more slowly or even stagnant in others (like Jamaica), consistent with either increasing or constant returns, resulting in irregular or steady growth solutions rather than steady levels (James, 1993).

Thus, in addition to the rate of technological change, $\frac{dA}{A}$, it now becomes necessary to make endogenous the rate of growth of human and social capital per unit of imports and the rate of growth of capital per unit of imports, in a context in which the binding import capacity constraint might make the rate of domestic saving a non-binding explanatory factor. This finding on human and social capital is consistent with the empirical results of Kim and Lau (1996), opening the possibility that in the presence of domestic human and social capital investment the growth of technology would be of minor significance in explaining productivity growth.

However, it is also consistent with the possibility that some education is intended as a proprietary asset by firms and even by government when viewed as an employer and as owner of enterprises, while many of the benefits accrue as externalities from both the average level of schooling, from the knowledge handed down by earlier generations (so-called traditional knowledge) and from the non-

proprietary approach of government to a significant portion of its spending on schooling and institutional development. So, a high rate of investment in human (including institutional) capital need not mean that the externalities factor, $\frac{dA}{A}$, explains nothing even if technology is just information. Sectors such as music and entertainment have demonstrated that private domestic investment in learning by doing and extensive experimentation can yield results that are non-proprietary and that combine with spillovers from overseas and from traditional knowledge is likely to be highly relevant to sustainable growth processes in Caribbean countries. Such investment is also highly complementary to appropriate investment in tertiary education and other forms of domestic capital, since these enhance the dissemination of the results from learning by doing and experimentation.

However, this appropriate investment is still in the background and still neglected by official policy. Policy remains focused on the adoption of technologies through those sectors that leverage imported technologies inputs operationally, as compared to the case of East Asia that gives major emphasis to adaptation. Education and other domestic capital facilitate both processes but their joint role is quite different in adaptation as compared to adoption because in the case of adaptation they lead the development and embodiment of intellectual property and cumulative causation through domestic physical capital. In some ways, this is what Wood (1994) observed in his detailed study of the role of education in successful export-oriented growth in East Asia. Disaggregation of the productivity model by broad sectors that leverage domestic capital versus those that leverage imported inputs clarifies these issues further.

Sectoral Productivity and Growth of Per Capita Income

The variable y_m is also a weighted average of import productivity in all sectors of the economy, with weights ψ_i defined in terms of the share of sector use of imported inputs in total employment of imports. As we shall see, the differentiation among sectors holds much of the key to the rate of productivity growth and it is important to build up understanding of import productivity growth by considering how the sectors of the economy contribute. Of particular importance in this regard is that productivity growth is characterized by increasing returns, depending on the relative weight of each sector in the economy and the specific role of those sectors that create increasing returns through capital creation and innovation (de Benedictis, 1998:262). Let x_{mi} be import productivity in sector i. In general, with the necessary care in specifying ψ_i, it is appropriate to write

$$19. \qquad y_m = \sum \psi_i x_{mi},$$

Assume two broad sectors producing outputs, X_a and X_b, differentiated by the relative intensity of use of imports (or the degree of operating leverage of imports). As a general matter, to represent the sectoral disaggregation of import productivity, it is necessary to write

$$Y = p_a X_a + p_b X_b \tag{20.}$$

and therefore

$$\frac{PY}{dM} = \frac{M_a}{M}\frac{p_a}{d}\frac{X_a}{M_a} + \frac{M_b}{M}\frac{p_b}{d}\frac{X_b}{M_b}. \tag{21.}$$

It follows that,

$$\frac{Y}{M} = \frac{M_a}{M}\frac{p_a}{P}\frac{X_a}{M_a} + \frac{M_b}{M}\frac{p_b}{P}\frac{X_b}{M_b} \tag{22.}$$

or,

$$y_m = \psi_a x_{ma} + \psi_b x_{mb}, \tag{23.}$$

with $x_{ma} = \frac{X_a}{M_a}$, $x_{ma} = \frac{X_a}{M_a}$, $\psi_a = \frac{M_a}{M}\frac{p_a}{P}$ and $\psi_b = \frac{M_b}{M}\frac{p_b}{P}$. The equations describe import productivity in terms of the import-share-weighted contribution of each sector to import productivity.

The production functions differ by sector mainly because of differences in the role of capital. In particular, in sector a, intersectoral production and trading of capital creates an endogenous, i.e., intersectoral, multiplier process, or process of increasing returns, so that it is necessary to write a simultaneous equations model. So, note that sector a must install enough capital to produce for its own use and for the rest of the economy that uses domestic physical capital. Using the same simple assumption as in (7), write

$$X_{aa} = v_{aa}(t) X_a \tag{24.}$$

The employment of human capital is also substantial but largely takes the form of apprenticeships and learning by doing, inherited information systems and democratisation processes, rather than the products of applicable information by the schooling system. The production model is

$$X_a = [A_a v_{aa}{}^{\alpha_a} L_a^{\beta_a} M_a^{1-\alpha_a-\beta_a}]^{\frac{1}{1-\alpha_a}}. \tag{25.}$$

Then, taking account of the efficiency of labour in sector a by applying the arguments in (11) and (14) through (16), import productivity is given by

$$26. \qquad x_{am} = \frac{X_a}{M_a} = A_a^{\frac{1}{1-\alpha_a}} \left(\frac{v_{aa}}{M_a}\right)^{\frac{\alpha_a}{1-\alpha_a}} \left(\frac{h_a^{\frac{1}{1-\tau_a}}}{M_a}\right)^{\frac{\beta_a}{1-\alpha_a}}.$$

In sector b, things are different. There is minimal or no employment of domestic non-human capital, so production is based on the imported input, M_b, which is primary to the economy and on the flow of work L_b. The sector benefits from the increasing returns created in sector a mainly through spillovers and government infrastructure as reflected partly in A_b. This also applies to its gains of externalities from the foreign innovation process. Thus, the appropriate production function is the more traditional formulation in (5) and

$$27. \qquad X_b = A_b L_b^{\beta_b} M_b^{\gamma_b}$$

with the assumption that $\beta_b + \gamma_b = 1$. Further, applying the arguments in (11) and (14) through (16),

$$28. \qquad x_{bm} = \frac{X_b}{M_b} = A_b \left(\frac{h_b^{\frac{1}{1-\tau_b}}}{M_b}\right)^{\beta_b}$$

Now, as a general matter

$$29. \qquad \frac{dy_m}{y_m} = \sum \frac{\psi_i x_{mi}}{y_m} \frac{dx_{mi}}{x_{mi}} + \sum \frac{\psi_i x_{mi}}{y_m} \frac{d\psi_i}{\psi_i}$$

with $\frac{\psi_i y_i^{(m)}}{y^{(m)}}$ being the import weighted contribution of sector i to total import productivity. The term $\sum \frac{\psi_i y_{mi}}{y_m} \frac{dy_{mi}}{y_{mi}}$ is the weighted average growth (or decline) of sectoral import productivity. The term $\sum \frac{\psi_i y_{mi}}{y_m} \frac{d\psi_i}{\psi_i}$ is the weighted average of changes (growth or decline) in the import share of the sectors. In particular,

$$30. \qquad \begin{aligned} \frac{d\psi_i}{\psi_i} &= \frac{M}{M_i} d\left(\frac{M_i}{M}\right) + \frac{P}{p_i} d\left(\frac{p_i}{P}\right) \\ &= \left(\frac{dM_i}{M_i} - \frac{dM}{M}\right) + \left(\frac{dp_i}{p_i} - \frac{dP}{P}\right). \end{aligned}$$

Thus, in a two-sector model, it follows that

$$
\begin{aligned}
31. \quad \frac{dy_m}{y_m} &= \frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}\left[\frac{1}{1-\alpha_a}\frac{dA_a}{A_a}+\frac{\beta_a}{1-\alpha_a}\left(\frac{1}{1-\tau_a}\frac{dh_a}{h_a}-\frac{dM_a}{M_a}\right)\right.\\
&\quad +\left(\frac{\alpha_a}{1-\alpha_a}-1\right)\left(\frac{dX_{aa}}{X_{aa}}-\frac{dM_a}{M_a}-\frac{dX_a}{X_a}\right)+\frac{dX_a}{X_a}\\
&\quad \left.+\left(\frac{dM_a}{M_a}-\frac{dM}{M}\right)+\left(\frac{dp_a}{p_a}-\frac{dP}{P}\right)\right]\\
&\quad +\frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}\left[\frac{dA_b}{A_b}+\beta_b\left(\frac{1}{1-\tau_b}\frac{dh_b}{h_b}-\frac{dM_b}{M_b}\right)\right.\\
&\quad \left.+\left(\frac{dM_b}{M_b}-\frac{dM}{M}\right)+\left(\frac{dp_b}{p_b}-\frac{dP}{P}\right)\right]
\end{aligned}
$$

which, in the light of the crucial significance of the disaggregation of the economy, is appropriately described as the appropriate equation of productivity growth for a Caribbean economy. Similarly, using (3) and (31), the appropriate equation of per capita income growth in a Caribbean economy is

$$
\begin{aligned}
32. \quad \frac{d\upsilon}{\upsilon} &= (1-\lambda)\left[\frac{dP}{P}-\frac{d\varepsilon}{\varepsilon}-\frac{dP_f}{P_f}\right]+\left(\frac{dM}{M}-\frac{dN}{N}\right)+\frac{dn}{n}+\frac{d\eta}{\eta}\\
&\quad +\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}\left[\left(\frac{dp_a}{p_a}-\frac{dP}{P}+\left(\frac{dM_a}{M_a}-\frac{dM}{M}\right)\right)\right]\\
&\quad +\frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}\left[\left(\frac{dp_b}{p_b}-\frac{dP}{P}\right)+\left(\frac{dM_b}{M_b}-\frac{dM}{M}\right)\right]\\
&\quad +\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}\left\{\frac{1}{1-\alpha_a}\frac{dA_a}{A_a}+\frac{\beta_a}{1-\alpha_a}\left(\frac{1}{1-\tau_a}\frac{dh_a}{h_a}-\frac{dM_a}{M_a}\right)\right.\\
&\quad \left.+\left(\frac{\alpha_a}{1-\alpha_a}-1\right)\left(\frac{dX_{aa}}{X_{aa}}-\frac{dM_a}{M_a}-\frac{dX_a}{X_a}\right)+\frac{dX_a}{X_a}\right\}\\
&\quad +\frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}\left\{\frac{dA_b}{A_b}+\beta_b\left(\frac{1}{1-\tau_b}\frac{dh_b}{h_b}-\frac{dM_b}{M_b}\right)\right\}
\end{aligned}
$$

The per capita income growth function in equation (32) allows replication of several earlier results in the Caribbean literature, with explicit comparison of the contributions of the two broad sectors of the economy. It incorporates from (31) several new insights about how productivity grows and introduces new options with respect to which growth rates and forms of capital deepening should be endogenously determined in the sense of being partially dependent on per capita income or import productivity as the economy develops, as well as on associated choices of governments and households about the development of domestic capital.

First among the factors is the rate of change of the terms of trade multiplied by the share of imports in total GDP, $(1-\lambda)[\frac{dP}{P}-\frac{d\varepsilon}{\varepsilon}-\frac{dP_f}{P_f}]$. This measure, is the negative of the rate of adjustment of the real exchange rate, and in (32) it replicates the result that a tendency to depreciation of the real exchange rate will also slow the growth of real per capita incomes, essentially by affecting the cost of financial capital to activate investment in human or non-human capital (Harris, 1997). In an endogenous growth framework, the term $[\frac{dP}{P}-\frac{d\varepsilon}{\varepsilon}-\frac{dP_f}{P_f}]$ could be expressed as a partial function of import productivity. The same applies to the rate of growth of imported inputs per worker $(\frac{dM}{M}-\frac{dN}{N})$, the rate of growth of the employment rate, $\frac{dn}{n}$, and the rate of growth of the labour force participation rate, $\frac{d\eta}{\eta}$, all of which are central to both the Solow-Swan tradition and the Romer-Lucas endogenous growth models.

Second, it is important to observe that the respective contributions of the sectors are weighted by the share of the sector import productivity in overall import productivity adjusted by the respective sector shares in the use of total imports in production, and in particular by $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}$ and $\frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}$, under the general expectation that $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}$ is significantly greater than $\frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}$ mainly because of the higher sectoral import productivity. To see the significance of this weighting condition, consider simple terms in (31) or (32) such as the rate of increase of sector prices relative to the rate of inflation and the rate of increase in employment of imports relative to the system as a whole, $(\frac{dp_a}{p_a}-\frac{dP}{P})+(\frac{dM_a}{M_a}-\frac{dM}{M})$ for sector a and $(\frac{dp_b}{p_b}-\frac{dP}{P})+(\frac{dM_b}{M_b}-\frac{dM}{M})$ for sector b. The weighting conditions clearly imply Lewis (1964) observation that reallocation of import capacity from the low to the high import-productivity sector would cause import productivity to grow first for purely arithmetic reasons. Since $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}>\frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}$, if $\frac{dM_a}{M_a}>\frac{dM_b}{M_b}$, and in particular if a net transfer occurs from the low to the high import productivity sector, so that $\frac{dM_a}{M_a}=-\frac{dM_b}{M_b}$, a gain in overall import productivity occurs because the loss of output in sector b that frees up the import capacity is less than the gain in output by employing that import capacity in the more import-productive sector a. Lewis (1954) also correctly observed that the same would apply to a structure of price inflation that favours production of capital over other commodities over other activities, $\frac{dp_a}{p_a}>\frac{dp_b}{p_b}$ (James, 1994).

The third important factor in (31 and 32) is $(\frac{\alpha_a}{1-\alpha_a}-1)(\frac{dX_{aa}}{X_{aa}}-\frac{dM_a}{M_a}-\frac{dX_a}{X_a})+\frac{dX_a}{X_a}$, which is unique to sector a. Under conditions when the output of domestic non-human

capital is growing ($\frac{dX_a}{X_a} > 0$), the fundamental endogenous forces of increasing returns (or increasing earnings per capita) are activated by accumulation of the stock of domestic capital per unit of imports, the key form of capital deepening, at a relatively faster rate ($\frac{dX_{aa}}{X_{aa}} - \frac{dM_a}{M_a} > \frac{dX_a}{X_a}$). This is also equivalent to both factor intensity reversal within the sector, and industrial restructuring in the form of the growth of domestic capital employment relative to capital production at a rate that is faster than the growth of imported inputs ($\frac{dX_{aa}}{X_{aa}} - \frac{dX_a}{X_a} > \frac{dM_a}{M_a}$). Note that here, the impact of this factor depends on an overall transformation multiplier given by the product of the increasing returns multiplier ($\frac{\alpha_a}{1-\alpha_a} - 1$) and the sector weight $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}$, defined by the contribution of the sector to overall import productivity adjusted by the sector share in the use of total imports in production. The term ($\frac{dX_{aa}}{X_{aa}} - \frac{dM_a}{M_a} - \frac{dX_a}{X_a}$) can be modelled endogenously as being partially dependent on import productivity or income per capita in the economy.

Fourth is the pair of factors in (31 and 32), ($\frac{1}{1-\tau_a}\frac{dh_a}{h_a} - \frac{dM_a}{M_a}$), which is magnified by the effects of endogenous increasing returns $\frac{\beta_a}{1-\alpha_a}$ created by sector a, and ($\frac{1}{1-\tau_b}\frac{dh_b}{h_b} - \frac{dM_b}{M_b}$), which is magnified by β_b and so features no similar effects. Both can be made partial endogenous functions of per capita income, reflecting the deliberate choices of government and households about how the educational and political institutions of the economy will evolve over time.

The terms indicate that to maximize growth of import productivity and per capita income, there must be sufficient increases in the accumulation of educational skills and supporting institutional capacity of the workforce of each sector and that this must grow at a faster rate than the growth of imports in either sector. Accumulation of domestic capital per unit of imports in isolation will not necessarily encounter diminishing returns as suggested by the Solow tradition but it will slow the rate of growth to suboptimal levels. With relevant domestic physical capital deepening underway, complementary deepening of human capital will increase both import productivity and income per capita and virtually guarantee perpetual increasing returns. The result replicates and extends Demas' (1965) argument that the development of the capacity to transform is a necessary aspect of the process of cumulative and circular causation that is a key to the industrial restructuring, domestic capital accumulation that will solve the long-term problem of import productivity growth and eliminate the balance of payments constraint.[5]

---

5 Abramovitz (1994) later raised similar issues about growth in the OECD context.

Significant differences exist in the effects generated by the two sectors. First, note that the absence of access to adequate schooling because of systemic policy discrimination and the absence of increasingly democratic institutions serves to slow the growth of h_a. Workers and entrepreneurs must compensate by relying on diligence emanating from the pressures of circumstances and accumulations of inspirational knowledge from prior generations and community-based knowledge sharing to compensate for discrimination by raising τ_a, as well as on high reliance on traditional knowledge, investment in learning by doing, and creative experimentation to make h_a reasonably high and make it grow. Further, sector a does not tend to expand its use of imports as rapidly as it produces domestic human and non-human capital, so it is expected that $\frac{1}{1-\tau_a}\frac{dh_a}{h_a}$ will grow substantially faster than $\frac{dM_a}{M_a}$ even as the latter must grow (Stiglitz, 1998).

By contrast, sector b engages in substantial employment of domestic institutional (such as government) capital and human capital produced by the formal school system, which was generally developed to serve the needs of sector b and to neglect sector a. At the same time, even without a democratisation process the public sector is accelerating public support for human capital investment in sector b to keep pace with its rapidly growing demand for imports in order to stay in line with OECD technologies. In principle, this is a systemic effort to avoid the lack of information about OECD technologies that Stiglitz (1998) argued is the result of weak dissemination processes caused by educational deficiencies. Further, taking into account factors such as signalling and the negative reaction to legacies of history, τ_b tends to be suppressed. In addition, local budget constraints and similar problems linked to the import capacity constraint may slow the growth of investment in human capital sufficiently so that, generally $\frac{1}{1-\tau_b}\frac{dh_b}{h_b}$ may be higher than $\frac{dM_b}{M_b}$ but it is expected that $\frac{\beta_a}{1-\alpha_a}(\frac{1}{1-\tau_a}\frac{dh_a}{h_a}-\frac{dM_a}{M_a}) > \beta_b(\frac{1}{1-\tau_b}\frac{dh_b}{h_b}-\frac{dM_b}{M_b})$. Then, taking into account the condition that $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m} > \frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}$, investment in relevant education and institutional development to support production of X_a will produce a greater transformative effect than the corresponding investment to support production of X_b. In other words, it is likely that productivity growth is made suboptimal by the bias of public policy in favour of investment to boost h_b and neglect h_a.

Fifth, the equations of productivity and income growth also replicate the expected significant role for system-wide efficiencies generated by the externalities associated with investment in human and non-human capital, but here these accrue at different rates through sector a, $\frac{dA_a}{A_a}$, and through sector b,

$\frac{dA_b}{A_b}$. One expects that the deliberate private-public strategy of rapid technological change in OECD countries, technology adoption by sector b, and the neglect of similar strategic support for sector a would generally result in $\frac{dA_b}{A_b} > \frac{dA_a}{A_a}$. However, in production of X_a, some human capital is treated as a proprietary asset by firms and even by government when viewed as an employer and as owner of enterprises, while many of the benefits accrue as externalities within the sector from the average level of schooling, the knowledge handed down by earlier generations (so-called traditional knowledge) and from the non-proprietary approach of government to a significant portion of its spending on schooling and institutional development in the sector.

Moreover, these investments contribute to increasing returns through the super multiplier $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}(\frac{1}{1-\alpha_a}) > \frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}$, the only multiplier attached to $\frac{dA_b}{A_b}$. So, even if technological externalities are just information transfers, a high rate of investment in human (including institutional) capital will not mean that the externalities factor $(\frac{dA_a}{A_a})$ explains nothing in the way that Kim and Lau (1996) found to be true for $\frac{dA_b}{A_b}$ in East Asia. Sectors such as music and enter-tainment have demonstrated that private domestic investment in learning by doing and extensive experimentation can yield results that are non-proprietary and that combined with spillovers from overseas and from traditional knowledge is likely to be highly relevant to sustainable growth processes in Caribbean countries. Such investment is also highly complementary to appropriate investment in tertiary education and other forms of domestic capital, since these enhance the dissemination of the results from the learning by doing and experimentation. It is therefore conceivable that the gains promised by Lewis's allocation arithmetic would also be gleaned by long term policy that is appropriately designed to yield $\frac{dA_a}{A_a} \geq \frac{dA_b}{A_b}$.

However, across the Caribbean the appropriate investments in domestic capital are still in the background and still neglected by official policy, typically incorporated into some sort of feel good cultural and social policy. Instead, education and economic policy remain focused on the adoption of technologies through X_b and on the relatively faster growth of education in that sector, i.e., on ensuring that for the purpose of technology adoption $\frac{dh_b}{h_b} > \frac{dM_b}{M_b}$. The problem with that approach is that mere adoption of skill-biased technologies is labour displacing and tends to make the unemployment and balance of payments problems difficult to solve unless the gods are kind and produce vast surpluses of foreign exchange from the production of X_b (as is currently the case with Trinidad and Tobago). It ignores the growth and development advantages of technological adaptation and the development of the domestic capital sector.

Apart from the gains from reallocation of import capacity to ensure that $\frac{dA_a}{A_a} \geq \frac{dA_b}{A_b}$, the mediating multipliers indicating increasing returns, $(\frac{\alpha_a}{1-\alpha_a} - 1) > 1$, and $\frac{\beta_a}{1-\alpha_a}(\frac{1}{1-\tau_a}) > (\frac{\beta_b}{1-\tau_b})$ further combine with the condition $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m} > \frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}$ to indicate that beyond Lewis's (1964) allocation arithmetic, the transfer of import capacity to capital production affects productivity by generating increasing returns through a set of transformation supermultipliers: (1) $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}(\frac{1}{1-\alpha_a}) > \frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}$ which scales up the externalities generated by production of X_a; (2) $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}(\frac{\beta_a}{1-\alpha_a}\frac{1}{1-\tau_a}) > \frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}(\frac{\beta_b}{1-\tau_b})$, which introduces nonlinearity in scaling up human capital deepening; and (3) $\frac{M_a}{M}\frac{p_a}{P}\frac{x_{ma}}{y_m}(\frac{\alpha_a}{1-\alpha_a} - 1)$ which scales up non-human domestic capital deepening, with the latter having no counterpart for sector b.

Specifically, the output growth from the transfer causes the subsequent growth of capital supplies to other subsectors, which then leads to the expanded employment of import capacity by some specifiable percentage governed by a set of overall transformation super-multipliers, and to more output, more demand for capital, and so on. The net gain from transfer of import capacity therefore leads to accelerated industrial restructuring through relatively faster growth of X_a while causing overall growth of import productivity to save foreign exchange and solve balance of payments and employment problems.

Of course, the independent positive contributions measured by a term such as $\frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}\frac{dA_b}{A_b}$ and $\frac{M_b}{M}\frac{p_b}{P}\frac{x_{mb}}{y_m}\beta_b(\frac{1}{1-\tau_b}\frac{dh_b}{h_b} - \frac{dM_b}{M_b})$ reassert Lewis's caution that all the advantages of producing X_b must still be optimally exploited. In production of X_b, especially in subsectors such as oil and gas and bauxite, there is no significant prospect that domestic capital and labour can do the work of imported inputs and their share in value-added is minimal. Such sectors must keep down costs and stay in line with market conditions by adopting the best available imported technologies and employing highly skilled workers from the education and training systems. However, as was observed by Lewis (1964) with respect to labour only, repeated balance of payments problems and perpetual unemployment (or migration) indicate that X_a can profitably use capital and labour even more intensively. In such cases, it is wasteful to invest in import capacity at rising rates of return to do things that domestic physical and human capital, and labour, can do. If the same investment was put to capital accumulation, technological progress and human capital development in X_a, then a better balance would be achieved with X_b and the total product would be higher.

However, like the investment to accumulate domestic capital, such an intersectoral transfer of resources requires the deliberate decisions of household, firms and governments to save and invest, so the latter might ultimately be best treated as endogenous to the system as well. Further, keeping in mind the industrial character of the capital development process and the associated need for investors to rely on significant external financing, the transfer of resources also requires development of suitable financial systems that are competent to shunt import capacity from the low-import-productivity sector b to the high import productivity sector a. The extent of development of this capacity would define the degree of sophistication of the financial sector and in the long run is also a function of import productivity and per capita income. However, if, given available surpluses of import capacity in sector b, the financial system is not sufficiently sophisticated to reallocate resources as necessary in the medium term, so that there is market failure with respect to this crucial form of reallocation, then the result is suboptimal growth of capital-intensive production and import productivity, and suboptimal growth of import productivity in the system as a whole. Such misallocation is quite costly in terms of lost opportunity to raise the standard of living and justifies continuing reform and redevelopment of policy interventions to reshape the financial sector that serves both human and non-human domestic capital investments.

Summary

The argument presented in this paper follows up suggestions by Lewis and Best, long ignored in the Caribbean literature, that growth of import productivity is the key to growth of output per capita in a Caribbean economy. It assumes increasing returns, and develops some basic proposals on how such productivity growth might be achieved. The results suggest that import productivity growth is likely to be optimized through a relatively faster rate of growth of investment in domestic physical capital per unit of imports relative to the import intensive sector and through relatively faster growth of investment in human capital to support this form of capital deepening.

Nonetheless, such growth is conditional on various factors, two of which are mentioned. First, a tendency to depreciation of the real exchange rate will also slow the growth of real per capita incomes. Second, to maximize growth of import productivity and per capita income, there must be sufficient increases in the accumulation of suitable educational skills and supporting institutional capacity of the workforce of each sector and this must grow at a faster rate than the growth of imports in either sector.

The model also reasserts Lewis' caution that all the advantages of import-intensive activity must still be optimally exploited, even if domestic capital-intensive activity must grow at a relatively rapid rate. However, it is wasteful to invest in import capacity at rising rates of return to do things that domestic physical and human capital can do. Like the investment to accumulate domestic capital, such an intersectoral transfer of resources requires the deliberate endogenous decisions of household, firms and governments to save and invest.

References

Abramovitz, M. 1994. "The Origins of the Post-War Catch and Convergence Boom", in J, Fagerberg, B. Verspagen, and N. von Tunzelmann, (eds.) (1994), *The Dynamics of Technology, Trade and Growth. Brookfield.* Edward Elgar Publishing, pp. 21-52.

Best, L.A.1968. "Outline of a Model of Pure Plantation Economy", *Social and Economic Studies,* 17(3), September: 283-326.

_____. 1971a. "Independent Thought and Caribbean Freedom", in Girvan and Jefferson (1971), *Readings in the Political Economy of the Caribbean,* Kingston: New World, pp. 7-28.

_____. 1971b. "Size and Survival", in N. Girvan, and O. Jefferson (1971), *Readings in the Political Economy of the Caribbean,* Kingston: New World, pp. 29-34.

_____. 1975. "A Biography of Labor", in G. Beckford (ed.), *Caribbean Economy: Dependence and Backwardness.* Mona: ISER, pp.147-158.

Best, L.A. and Levitt, K. 1969. "Externally Propelled Growth and Industrialisation", (3 volumes, mimeo), Montreal: McGill University.

Chung, J.W. 1994. "Utility and Production Functions, Cambridge", Blackwell.

deBenedictis, L. 1998. "Cumulative Causation, Harrod's Trade Multiplier and Kaldor's Paradox: The Foundations of Post-Keynesian Theory of Growth Differentials", in G. Rampa, G. Stella, and A. P. Thirlwall, *Economic Dynamics, Trade and Growth. London,* Macmillan Press.

Demas, W.G. 1965. "The Economics of Development in Small Countries: With Special Reference to The Caribbean", Montreal: McGill University Press.

Government of Jamaica. 1996. National Industrial Policy, Kingston: Office of the Prime Minister.

Hamilton, R. 1994. "Analyzing Real Wages, Prices and Productivity and the Effects of State Intervention in Caribbean Type Economies", *Social and Economic Studies,* Vol. 43, No 1, March, pp. 1-42.

Harris, D.J. 1997. "Jamaica's Export Economy: Towards a Strategy of Export-led Growth", Kingston: Ian Randle and Jamaica Exporters Association.

James, V. 1993. "Beyond the Plantation Economy Critique of the Theory of the Firm", *Social and Economic Studies,* Vol. 42, Nos. 2&3, June & September.

_____. 1994. "Surplus in Lewis's Theory of Development", *Review of Radical Political Economy,* 26(4), 76-98.

Kaldor, N. 1957. "A Model of Economic Growth", *Economic Journal,* Vol. 67, pp. 591-624.

_____. 1978. "Further Essays on Economic Growth." London: Duckworth.

Kim, J. and L. J. Lau. 1996. "The Sources of Economic Growth of East Asian Newly Industrialized Countries: Some Further Evidence." Faculty working paper, Department of Economics, Stanford University an summarized in AEA Papers and Proceedings, May.

Lewis, W.A. 1954. "Economic Development with Unlimited Supplies of Labour", *The Manchester School of Economic and Social Studies,* 22 (May): 139-191.

_____. 1958. "Employment Policy in an Underdeveloped Area", *Social and Economic Studies* 7(3) September: 42-54.

_____. 1964. "Jamaica's Economic Problems, The Gleaner", Kingston: *The Gleaner Company,* (September) (a series).

Lucas, R.E. 1988. "On the Mechanics of Economic Development", *Journal of Monetary Economics,* 22: 3-42.

Mankiw, N.G, Romer, D. and Weil, D. N. 1992. "A Contribution to the Empirics of Economic Growth", *Quarterly Journal of Economics,* 107 (May): 407-437.

McMahon, W.M. 1999. "Education and Development: Measuring the Social Benefits", Oxford: Oxford University Press.

Myrdal, G. 1957. "Economic Theory of Underdeveloped Regions." London: Duckworth.

Romer, P. 1986. "Increasing Returns and Long Run Growth", *Journal of Political Economy,* 94: 1002-37.

_____. 1990. "Endogenous Technical Change", *Journal of Political Economy,* 98: 571-93.

_____. 1993. "Two Strategies for Economic Development: Using Ideas and Producing Ideas, Proceedings of the World Bank Conference on Development Economics, 1992", *Supplement to the World Bank Economic Review and the World Bank Research Observer,* 63-91.

Solow, R.M. 1956. "A Contribution to the Theory of Economic Growth", *The Quarterly Journal of Economics,* 70: 65-95.

Stiglitz, J.E. 1998. "The Economics of Intervention: A Theorist's Persistent Question", New York Times, 31 May, Section 3 p. 12.

Swan, T. 1956. "Economic Growth and Capital Accumulation", *The Economic Record,* 32: 334-361.

McCombie, J.S.L. and A.P. Thirlwall. 1994. "Economic Growth and the Balance of Payments Constraint", New York: St. Martins.

Wood, A. 1994. "North-South Trade, Employment and Inequality: Changing Fortunes in a Skill-Driven World", Oxford: Clarendon Press.

2

Monetary Policy, Central Banks and Economic Performance in the Caribbean

Derick Boyd and Ron Smith

Abstract

There is a growing consensus that monetary policy occupies a primary position in macroeconomic management. This study analyses how monetary policy has performed in a sample of Caribbean countries and the benefits of a single currency institutional framework. It establishes the basis for short-run effects of monetary policy à la Clarida, Gali and Gertler (1999). Although important lessons may be learnt from this model, within developing countries the institutional context and the channels through which monetary policy works are much more complex, because of the large differences between countries. In a descriptive statistics analysis, framed within the discretion versus rules debate, the paper argues that there is not only an association between monetary policy, inflation and economic performance, but also that the institutional contexts provide varying degrees of constraints on policy. A univariate analysis of the price variables to conduct a comparative analysis on inflation and the background to the relationship between mean inflation and inflation persistence are used. The coefficients in the univariate representation reflect feedbacks through other variables. To investigate these feedbacks two forms of Vector Autoregressions (VARS) are considered: unrestricted VARs and a long-run cointegrating Vector Error Correcting Model (VECM).

Introduction

Since the 1990s, a growing consensus has emerged among academics and policy practitioners that monetary policy occupies a primary position in macroeconomic management. Indeed, considerable progress has been made from a theoretical perspective and in the application of economic policies aimed at stabilising economies both in terms of prices and real variables. In addition, a substantial view has developed in the literature that policy rules have major advantages over discretion in improving economic performance. Furthermore, low inflation should be promoted as the primary objective of monetary

policy and increasingly regarded as the important precondition for economic growth and development for open economies.

The quest for financial stabilisation in both developing and emerging market economies has given rise to a resurgence of interest in the institutional framework of currency boards. This has formed a part of the corner solution or bipolar view of exchange rate regimes as a conditional choice between a hard peg (through a currency board arrangement, a currency union or some form of dollarisation) and a float (Fischer, 2001). The establishment of the European Monetary Union has also focused attention on the effect of currency unions and renewed interest in the many, mostly small, currency unions that have been established for some time (Honohan and Lane, 2000; Rose, 2000).

This paper examines how monetary policy has performed in a sample of Caribbean countries, with the view of shedding light on the question of the benefits of a single currency institutional framework. Section 2 discusses the monetary policy framework used in the analysis; in Section 3, the macroeconomic framework, institutional structure, policy and performance of the twelve Caribbean economies in the sample group are analysed. Section 4 presents the univariate analysis of price inflation, while in Section 5, the set of variables to be used in the estimations is discussed and the resulting causality relations examined. In Section 6 unrestricted and cointegrating vector autoregression analyses are estimated. Section 7 presents the conclusions of the study and comments on follow up work.

Monetary Policy Framework

Since Theil and Tinbergen, economic policy has been analysed within a standard framework of five elements: objectives, instruments, model, forecasts and implementation. The policy maker or the central bank (CB) has certain objectives in terms of target variables that it wishes to influence and certain instruments that it can control. The CB has a model of the monetary transmission mechanism, showing how the instruments influence the targeted variables. The CB and other agents make forecasts of each other's actions and exogenous shocks. The CB then implements what it considers the optimal setting of the instruments, other agents respond and outcomes are observed. This is a useful framework that shall be used in this study, but it is important to recognise that it operates within an institutional context, which shapes the choices available. For instance, even if the CB can develop optimal policies it may not be able to implement them because of political constraints on its independence. Nonetheless, it is usefull to begin with the standard account of how monetary policy is set in industrialised countries.

Below, the model in Clarida, Gali and Gertler (1999), CGG, is set out. It is usually assumed that the CB's objective is a discounted sum of some function, usually quadratic, of current and expected future deviations of inflation, π_t from its target and the output gap, x_t (the difference of log output from its natural rate). For instance, it may minimise a loss function of the form:

$$L = E_t \sum_{i=0}^{\infty} \beta^i \left(\alpha x_{t+i}^{\ 2} + \beta \pi_{t+i}^{\ 2} \right)$$

where E_t denotes expectations formed at time t and β is the discount factor. The instrument is usually assumed to be the short-term interest rate, r_t. The transmission mechanism involves two equations. In the first, the interest rate influences, perhaps with a lag, the output gap through an aggregate demand (IS) curve. The CGG form of the relationship is:

$$x_t = -\phi(r_t - E_t\pi_t) + E_t x_{t+1} + g_t$$

where g_t is a demand shock determined by government expenditure. In the second, the output gap influences inflation, again perhaps with a lag, through an aggregate supply (Phillips) curve. An LM curve could be added to this model to determine money demand, but it is not necessary since the interest rate rather than the money supply is the policy instrument. The shift from utilising money supply as the instrument to treating interest rates as the instrument reflects instability in money demand functions because of financial innovation. This account assumes that the CB, by changing the short rate, can influence the long-rate, which is what should appear in the aggregate demand curve. Both the CB and the private sector make forecasts using rational expectations, with information available at time *t*. An important issue here is whether the CB can affect the forecasts of the private sector, and thus the long rate of interest, through commitment to a target or a rule. It can do this if it has credibility with the private sector. Finally, the implementation of the optimal policy is often expressed in terms of a Taylor Rule, by which the short-term interest rate adjusts slowly to a desired value, which is a function of (expected or actual) deviations of inflation from the target and the output gap. For instance, assuming target inflation is zero and actually replaces expected values, the rule takes the form:

$$r_t - r_{t-1} = \mu(r_t^* - r_{t-1})$$
$$r_t^* = \gamma_0 + \gamma_1\pi_t + \gamma_2 x_t$$

For stability, $\gamma_1 > 1$ is required.

The institutional context of such a description assumes floating exchange rates and fairly free movement of capital in and out of the country. The exchange rate is not a target, though it may play a role in the transmission mechanism from interest rates to output and inflation. Within the standard structure it is impossible to have an independent monetary policy, fixed exchange rates and free movement of capital. At least one of these three elements must be dropped. One can have fixed exchange rates and an independent monetary policy, as under Bretton Woods, if the exchange rate is protected by controls on capital movements. In principle, one can have free movements of capital and a fixed exchange rate if monetary policy is devoted to maintaining the exchange rate target. In practice, this may be difficult to achieve, since the monetary policies required may not be feasible. The institutional context also assumes fairly thick financial markets in which interest rate changes have effects on the real economy. The structure of financial markets and the role of government debt within the financial system will influence objectives, instruments, transmission mechanisms

and implementation of policy. The institutional context also posits a solvent public sector, which does not need to print money to finance its deficit through seignorage.

Although important lessons may be learnt from the model it is not directly applicable to many developing countries. In the standard model described above, one can ignore money; the central bank just supplies whatever is demanded at the policy determined interest rate. In many developing countries, however, interest rates are less effective as a policy instrument and the money supply process is crucial. Money supply may be determined by the government budget constraint, where the deficit has to be financed by issuing bonds and/or money or it may be determined by the balance of payments constraint where there are currency board arrangements. In either case a money supply equation replaces the Taylor rule in the determination of interest rates.

Within developing countries the institutional context and the channels through which monetary policy works are much more complex because of the large differences between countries. The objective, then, will be to identify the differences in policy and the transmission mechanism and use this to shed light on the qualitative differences in institutional context. These would determine the growth of the natural rate of output, the equilibrium real interest rate and real exchange rate in the economy. In developing countries it is also much less plausible to assume that the long-run real variables are close to their equilibrium values; thus the analysis of growth and cycles cannot be as easily disentangled. To provide some background to this, a brief review of the literature on objectives, instruments and transmission mechanisms for monetary policy in developing countries is given, before a survey of some empirical studies.

Macroeconomic Performance and Institutional Framework

In a comparative examination of the monetary transmission mechanism, there are historical and institutional reasons that make the English-speaking Caribbean countries particularly interesting. These countries share a common colonial institutional background in that they were all British territories which, prior to their independence, were governed within a fairly common institutional economic framework. From the early 1960s, they gradually became politically independent and were allowed to pursue independent economic policies, first adopting fixed exchange rate regimes initially pegged to the pound sterling, but from the 1970s moving to the US$.

In this study there are twelve Caribbean countries, of which six - Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines - belong to the Eastern Caribbean Central Bank (ECCB) group.[1] The other six are The Bahamas, Barbados, Guyana, Belize, Jamaica and Trinidad and Tobago. Three of these countries have significant physical resources:

---

1 The ECCB monetary union consists of eight countries (Anguilla and Montserrat are excluded from this study due to the unavailability of data).

Guyana with agricultural and various minerals; Jamaica with bauxite; and Trinidad and Tobago with oil and gas. In spite of their resource advantages, however, Guyana and Jamaica recorded the lowest per capita incomes relative to the other countries (see Table 1).

Table 1. Country Characteristic Variables, 1998

	Total Population	Urban Population (% of Exports)	Int. Tourism Receipts (% of Exports)	GDP (Per Capita) PPP (Current Interest $)	% Growth of GDP Per Capita (1980-1998)
ECCB					
Antigua and Barbuda	66,860	36	60	9277	7.3
Dominica	73,000	70	30	5102	6.9
Grenada	96,200	37	44	5838	6.9
St. Kitts and Nevis	40,820	34	53	10672	8.6
St. Lucia	152,000	38	76	5183	6.4
St. Vincent & Grenadines	113,220	52	46	4692	7.0
Non-ECCB					
The Bahamas	294,000	88	74	14614	2.9
Barbados	265,630	49	55	n.a.	
Belize	238,500	53	30	4566	4.7
Guyana	849,180	37	9	3403	3.1
Jamaica	2,576,000	55	35	3389	3.3
Trinidad and Tobago	1,285,140	73	7	7485	2.3
United Kingdom	59,055,000	89	6	20336	5.0
United States	270,299,008	77	8	29605	4.8

Source: World Bank, World Development Indicators, 2000 CD-ROM.

Note: n.a. means not available.

In the post-independence period, the countries formed independent monetary institutions. Six of the smallest island states created a currency union with a single monetary authority, the Eastern Caribbean Central Bank (ECCB). The other six chose stand-alone central banks for their individual states, following largely the model of the Bank of England but developing individual characteristics. These set (central bank) the institutional contexts of monetary policy and provide the constraints within which macro policy takes place.

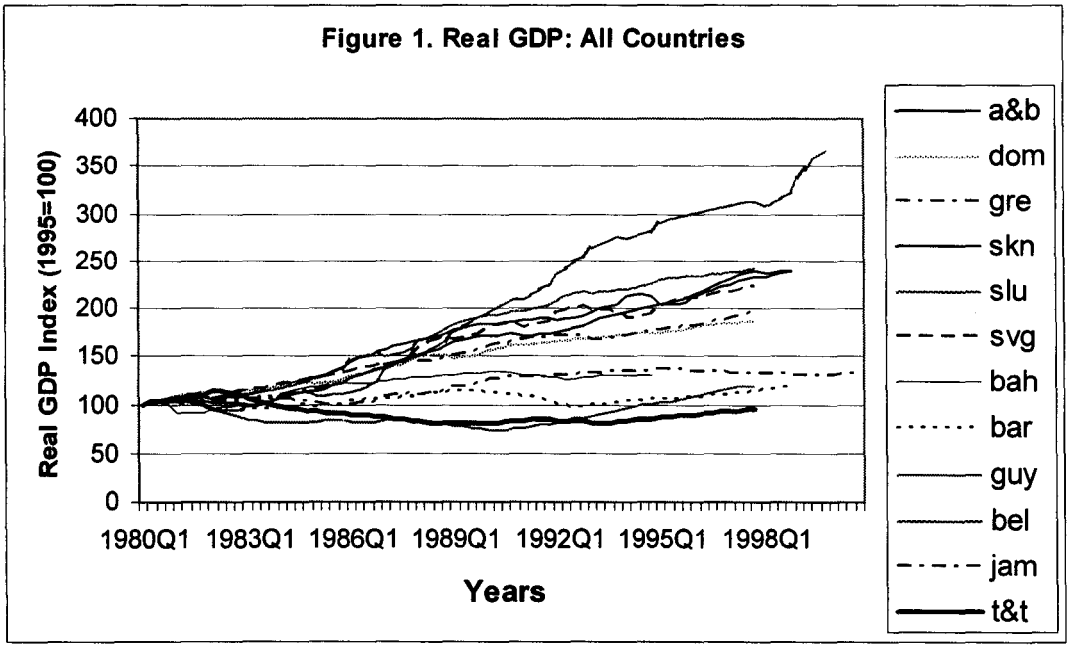
The countries of the ECCB group are microstates in both geographical and population terms. St. Lucia has the largest population of 152,000 people. The two ECCB countries excluded from this study - Montserrat and Anguilla - have between them the smallest population and the smallest land area. The ECCB sample, therefore, can be taken to be representative of that population.

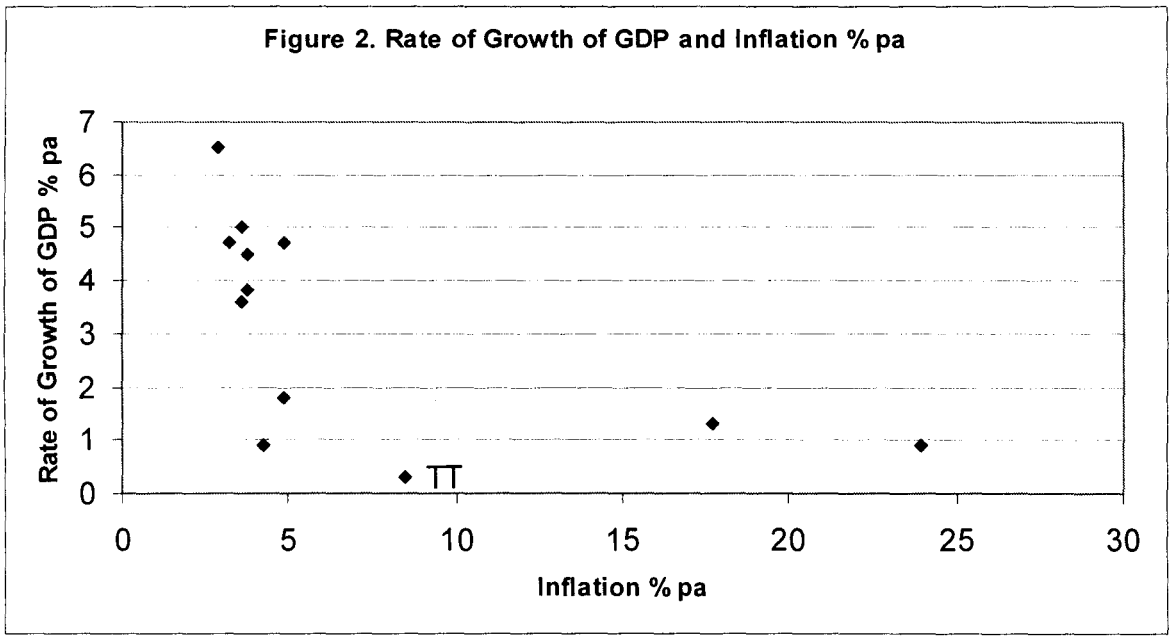
The populations of the ECCB are mainly located in rural areas (over 60 percent) and rely heavily on revenues from international tourism. Tourism receipts for 1998 in the ECCB islands ranges between 30% and 76% of their total exports (see Table 1). By way of comparison, in 1998, the tourism receipts as a percentage of total exports for the United Kingdom (UK) and United States of America (USA) were 6% and 8%, respectively.

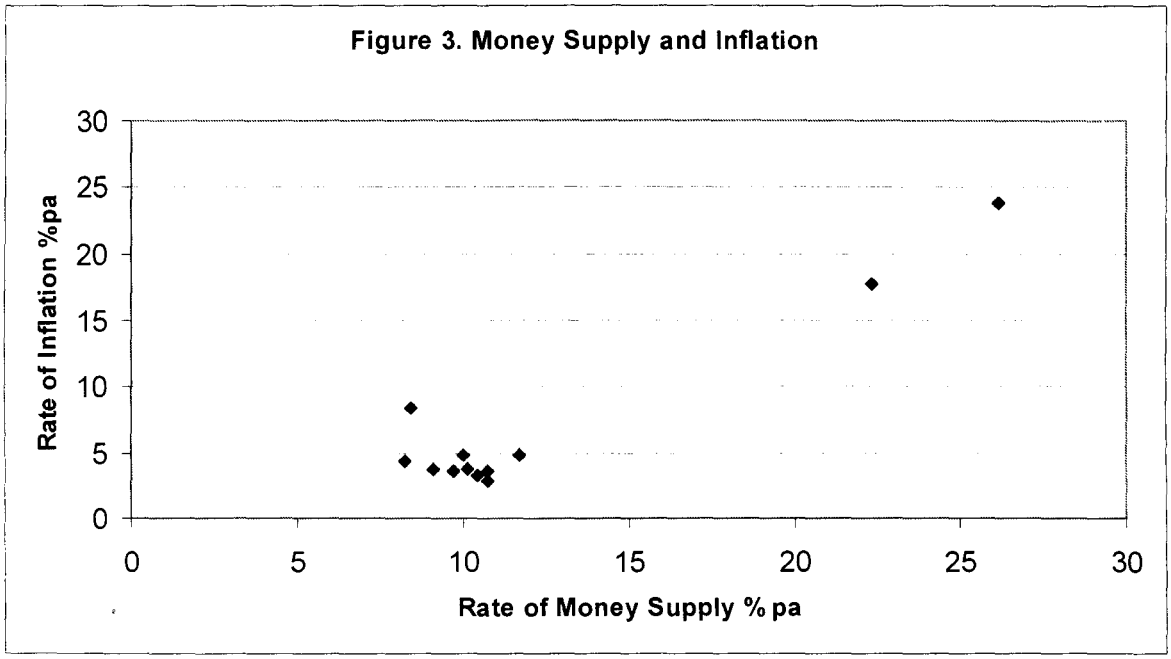
The growth experience of these countries provides insight into the dynamics of their economic activity. In Figure 1 real GDP is re-based so that 1995=100 for all countries; the slope of the real GDP line indicates the rate of growth. The four countries with the flattest lines implying the slowest rate of growth since 1990 are Trinidad and Tobago, Guyana, Barbados and Jamaica. These are the four major economies of the English-speaking Caribbean and with the notable exception of Barbados, the most highly resource-endowed. The bunching of lines with the steeper slopes are the ECCB countries and Belize. The growth experience of the sample suggests one group recorded consistent growth and the other very low and inconsistent growth (Atkins and Boyd, 1998).

The growth in output is inversely associated with the inflation experience of the countries, discernible from Figure 2, and the inflation rate is positively linearly related to the rate of growth in the broad money supply, as can be observed in Figure 3.

Figure 1. Real GDP: All Countries







In the relatively low inflation countries real interest rates were, on average, positive over the period while in the case of Guyana, Jamaica and Trinidad and Tobago average real interest rates were negative. Nominal exchange rates for the ECCB, The Bahamas, Barbados and Belize were constant over the period while Guyana, Jamaica and Trinidad and Tobago underwent significant devaluations associated with prolonged balance of payments and foreign exchange crises.

The monetary institutional framework of the economies provides a basis for explaining the variation in the economic performances. Jamaica established a central bank in 1962, Trinidad and Tobago and Guyana in 1965 and Barbados in 1972. These were modelled along the lines of the Bank of England, marking a significant break with the previous currency board arrangements underlying monetary policy in these countries. As with the Bank of England at that time, these central banks did not operate independently but rather served essentially as a department of the central government.

In 1965 the East Caribbean Currency Authority (ECCA) was established, replacing the British Caribbean Currency Authority (BCCB), responsible for the Eastern Caribbean dollar (EC$).[2] The ECCA had headquarters in Barbados serving that country as well as the states of the remaining Caribbean islands – effectively the current members of the ECCB. Unlike the newly established central banks above, the ECCA retained not only the currency union aspect of its predecessor, the BCCB, but also the currency board element of its operations - for commercial banks to obtain cash they had to continue to deposit the sterling equivalent with the Authority's agents in London. So that at the start, the ECCA currency, the Eastern Caribbean dollar (EC$), was 100% backed by sterling (ECCA, 1982). Over time, as the role of the Authority developed and it began lending to member governments, the 100% foreign asset backing was reduced to requiring it to maintain a minimum of 60% external assets backing of the currency in circulation and other demand liabilities.

In time, Barbados left to establish its own currency and central bank, and the Eastern Caribbean Central Bank (ECCB) was established in 1983, replacing the ECCA. The ECCB, however, retained the important features of the ECCA. So that, whilst the ECCB developed as a central bank that can and does function much as any central bank in the support of member countries' economic and monetary policies, it has continued the currency union and currency board institutional arrangement of the old British Caribbean Currency Authority and retained the currency board aspect of its operations - the 60% backing of the currency introduced by the ECCA. Moreover, this regulatory 60% minimum foreign assets backing of the EC$ understates the real backing of the EC$ that tends more towards 100% - for instance, in March 2002 the backing was 97%.

The Central Bank of The Bahamas (CBB), created in 1974, like the ECCB, has also retained a currency board element as it evolved from a colonial currency board institution, through to a monetary authority and into a central bank. Moreover, monetary stability is the primary constitutional role of the CBB and it is required to ensure that external reserves are maintained at a minimum of at least 50% of the value of total notes and coins in circulation and demand liabilities

---

2 The governing colonial monetary institution of the Caribbean was a long established currency board system (Schuler, 1992) and whilst it evolved, it essentially remained in place well into the post World War II era. The British Government established the British Caribbean Currency Authority (BCCA) in 1950 as the central monetary authority for British colonies in the Caribbean. The BCCA functioned as a currency board and colonial authorities could only issue new currency against the equivalent holding of sterling securities in London (Blackman, 1998).

of the Bank. Like the ECCB, the CBB generally reports reserves in excess of this minimum.

The low inflation and exchange rate stability of the ECCB and The Bahamas can be seen as importantly influenced by the currency board aspect of their institutional structure that enforced monetary and fiscal discipline. This, in turn, has promoted stability in their output and external accounts and nominal exchange rate.

In the cases of Barbados and Belize, although they have the institutional features of the non-independent stand-alone central bank, monetary stability was an essential aspect of their operations. An important attribute of the Barbados currency stability success arises from the prudence that characterises its operations and the policy credibility that rapidly developed with the establishment of the Central Bank of Barbados. So whilst the currency board framework constrained the ECCB and the CBB to prudent monetary policies, the prudence in the case of Barbados and Belize resulted from conservative discretionary policy choices. Commitment to an anti-inflationary policy and the credibility of policy pursuant to that objective underlie the successful economic performance of Barbados.

The poor monetary policy performance of Guyana, Jamaica and Trinidad and Tobago may be seen as resulting from imprudent discretionary policy choices largely as a result of accommodating their central government debts which were incurred in the hope that they could be repaid by future growth and resource earnings.

The CGG (1999) framework described above provides a sound general starting point from which to analyse Caribbean economies. The approach rests on the notion that temporary nominal price rigidities provide the key friction that gives rise to non-neutral effects of monetary policy. Within this approach, developed in the main with reference to industrial economies, the primary monetary policy instrument is a short-term interest rate. An important aspect of this approach, as distinct from its IS/LM predecessor, is that private sector behaviour depends on expected as well as current monetary policy. Thus, since expectations concerning future policy also determine current behaviour, the credibility of monetary policy becomes relevant, and this is borne out by the attention this attracted in the recent literature. One way of enhancing policy credibility is through policy rules, as in the Taylor rule or through certain established monetary policy reaction functions, embedded in what Blackman (1998), among others, would call conservative monetary policy, and this seems to underlie the credibility of the Barbadian monetary policy experience. Another way of enhancing credibility is to adopt a monetary policy institutional framework that constrains policy far more rigidly than a Taylor rule or conservative monetary policy, such as the currency board arrangements found in the Eastern Caribbean Central Bank and the Central Bank of The Bahamas. The latter seems useful in the cases of particularly vulnerable small open economies (Repse, 1999).

There is a growing body of literature that suggests that there may be gains from making binding commitments over the course of monetary policy or, alternatively, making institutional arrangements that accomplish that same purpose. The issue of whether there may be some simple institutional mechanisms that can approximate the effect of the idealised policy commitment

is one that is pertinent to the varied experience of the Caribbean economies and addressed in a plurality of ways. Overall, their experience appears to provide some evidence to support the conclusions that..."perhaps the most useful answer to the question comes from Rogoff, (1985), who proposed the appointment of a "conservative" central banker, taken in this context to mean someone with a greater distaste for inflation than society as a whole" (CGG 1999, p.1677). The comparative analysis indicates, however, further evidence of institutional arrangements that may work to enhance policy credibility within a framework more rigid than the ones suggested by policy rules.

Univariate Analysis

Consider a very simple version of the three-equation model used above, of the Phillips Curve, IS curve and Taylor Rule, where lagged inflation is used for expected inflation.

$$\pi_t = \alpha_0 + \lambda x_t + \beta \pi_{t-1}$$
$$x_t = \phi_0 - \phi_1 (r_t - \pi_{t-1})$$
$$r_t = \gamma_0 + \gamma_1 \pi_{t-1} + \gamma_2 x_t$$

This can be interpreted as the structural form. Using the last two equations gives

$$x_t = \theta\left[(\phi_0 - \phi_1\gamma_0) + \phi_1(1-\gamma_1)\pi_{t-1}\right]$$

and substituting this in the first equation derives the following univariate representation for inflation

$$\pi_t = \left[\alpha_0 + \lambda\theta(\phi_0 - \phi_1\gamma_0)\right] + \left[\beta - \lambda\theta\phi_1\gamma_1\right]\pi_{t-1}$$

Notice that the parameters are complicated functions of the underlying structural coefficients, including the coefficients of the policy rule. The persistence of inflation (the second term) is of some interest because it has often been argued that it is a function of monetary policy or the exchange rate regime. For example, Alogoskoufis and Smith (1991) point out that persistence will be lower under fixed exchange rates, and there is a large subsequent literature about the interaction between inflation and monetary policy regimes.

To allow for rather more complicated dynamics than a simple autoregression, an Augmented Dickey Fuller type univariate equation for inflation will be utilised, that is,

$$\Delta p_t = a + bp_{t-1} + c\Delta p_{t-1} + d\Delta^2 p_{t-1} + et + \varepsilon_t \qquad (1)$$

where p_t is log price level and $\Delta p_t = \pi_t$ is inflation. This nests a number of interesting cases. If *b=0*, there is a unit root in the price level and inflation is I(1). If *b=0* and *e=0*, then *c* is a measure of the persistence of inflation, ρ, and the equilibrium inflation rate is $\pi^* = a/(1-c)$, which is likely to be close to the mean inflation since the mean of $\Delta^2 p_{t-1}$, the average acceleration in inflation, is likely to be close to zero. In the estimates of Equation (1), not reported,[3] the hypothesis of a unit root can be rejected in Gre,[4] Slu, SVG, Bar and there is some evidence against a unit root in Bel – the ADF statistics is marginally below the critical value.

These results raise a modelling issue that will recur. The ADF tests suggest different models for different countries should be used, treating the variables as I(0) in 4 cases and I(1) in the rest. However, different models for different countries imply a loss in comparability. Therefore, where different specifications appear appropriate in different countries, the alternative models for all countries will be estimated. In this case, the alternatives are the trend stationary model, estimated above, and the unit root model.

The unit root restriction was imposed to give a second order autoregression in the inflation rate

$$\Delta p_t = \alpha + \rho \Delta p_{t-1} + \gamma \Delta^2 p_{t-1} + \varepsilon_t \qquad (2)$$

This was estimated for all 12 countries and Table 2 gives mean inflation (percentage per annum), the persistence of inflation, ρ, and its standard error and the estimate of the standard error of the regression, Ser, σ, which measures the average size of the inflation shocks, the t statistic for $\rho = 1$ (ADF Statistic) and the t statistic for $\rho = 0$; γ which is not reported was negative for all countries but Jamaica. Except for Jamaica, acceleration in inflation tends to be followed by a fall in inflation, stabilising the system.

These results indicate that there is some tendency for countries with higher mean inflation to have more persistence and larger variances (see Figures 4 and 5). Guyana and Jamaica, and to a certain extent Trinidad and Tobago, have a different relationship from the other countries in the sample. This is in line with the results of the previous section which show that countries with either institutional restrictions on monetary policy (ECCB and The Bahamas) or conservative monetary policies (Barbados and Belize) show low inflations results,

---

3 These results and the full text of the working manuscript can be found at http://homepages.uel.ac.uk/D.A.C.Boyd/Eccb%20complete%20manuscript%2014July2003.doc

4 Country names abbreviations are used in the tables and texts: Antigua and Barbuda (AB), Dominica (Dom), Grenada (Gre), St. Kitts and Nevis (SKN), St. Lucia (Slu), St. Vincent and the Grenadines (SVG), The Bahamas (Bah), Barbados (Bar), Guyana (Guy), Belize (Bel), Jamaica (Jam), Trinidad and Tobago (TT).

Table 2
Restricted ADF Estimates

Countries	Mean Inflation	Persistence ρ	Se (ρ)	σ	ADF, t	t
ECCB						
AB	4.94	0.8156	0.0774	0.53	-2.38190	10.5323
DOM	3.6	0.1516	0.1475	1.31	-5.75186	1.027797
GRE	3.8	0.5648	0.0796	0.87	-5.46734	7.095477
SKN	3.24	0.3171	0.1318	0.98	-5.18134	2.405918
SLU	3.6	0.2227	0.1507	1.58	-5.15793	1.47777
SVG	3.76	0.2554	0.1535	1.37	-4.85147	1.663192
Non-ECCB						
BAH	4.84	0.4835	0.1275	0.66	-4.05098	3.792157
BAR	4.28	0.2316	0.1489	1.55	-5.16398	1.556452
GUY	23.92	0.5633	0.1221	8.48	-3.57658	4.613432
BEL	2.88	0.3894	0.1252	1.15	-4.877	3.110224
JAM	17.68	0.7529	0.0695	2.34	-3.5554	10.83309
TT	8.44	0.3839	0.1416	1.35	-4.35099	2.711158

Note: mean inflation is measured as percentage per annum.

while those governed by discretionary policies (Guyana, Jamaica, Trinidad and Tobago) have higher inflation outcomes.

The AB result with respect to inflation persistence is at odds with the rest of the ECCB countries. It has a low mean inflation of 4.9 % per annum, and a small variation with Ser 0.5%, but has the highest measured persistence, 0.82. Also, on these estimates AB is the only case where a unit root in inflation cannot be rejected. This anomaly is difficult to explain, but it may be connected with measurement issues. Conversely, Trinidad and Tobago has a high inflation of 2.1%, large Ser of 1.35%, but quite low persistence of 0.38. For Barbados and three of the ECCB countries, Dom, SLU and SVG, the hypothesis that inflation persistence is zero cannot be rejected.

Overall, the results provide evidence of an association between the monetary policy framework of the countries and their inflation performance and shed some light on the different inflation outcomes of the countries. All the ECCB countries, Bah, Bar and Bel show low mean inflation rates and variation in rates and, with the exception of AB, low inflation persistence. In contrast, Guy and Jam show high mean rates, persistence and variations in inflation.

Figure 4. Mean Inflation and Inflation Persistence

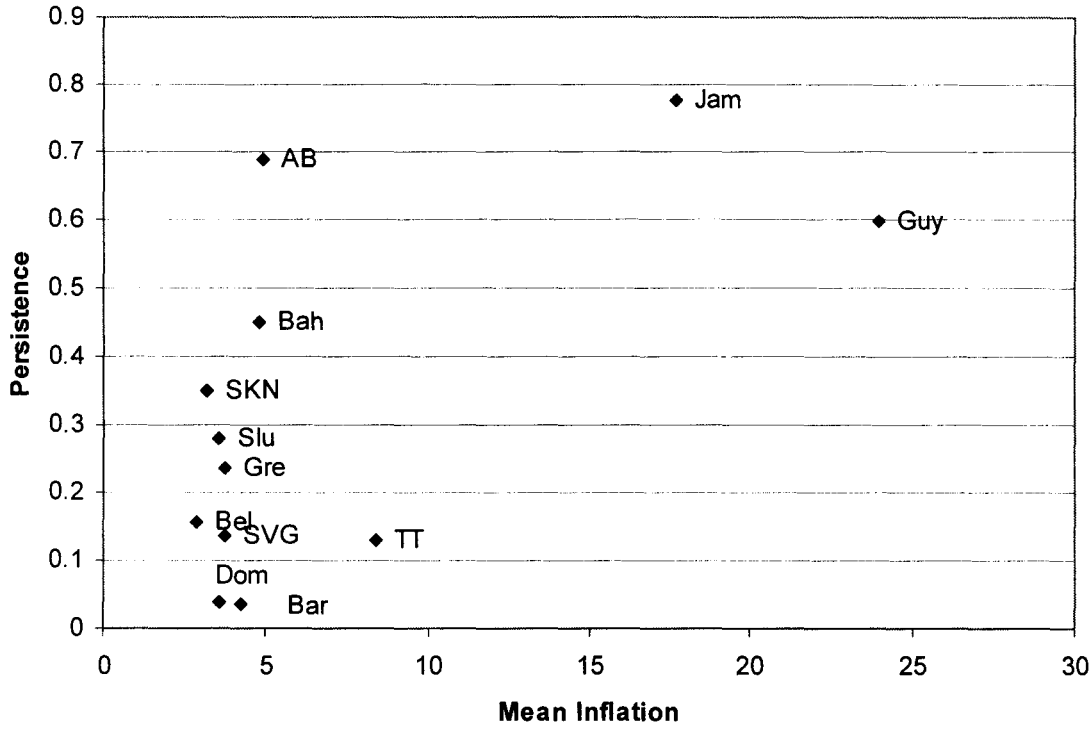
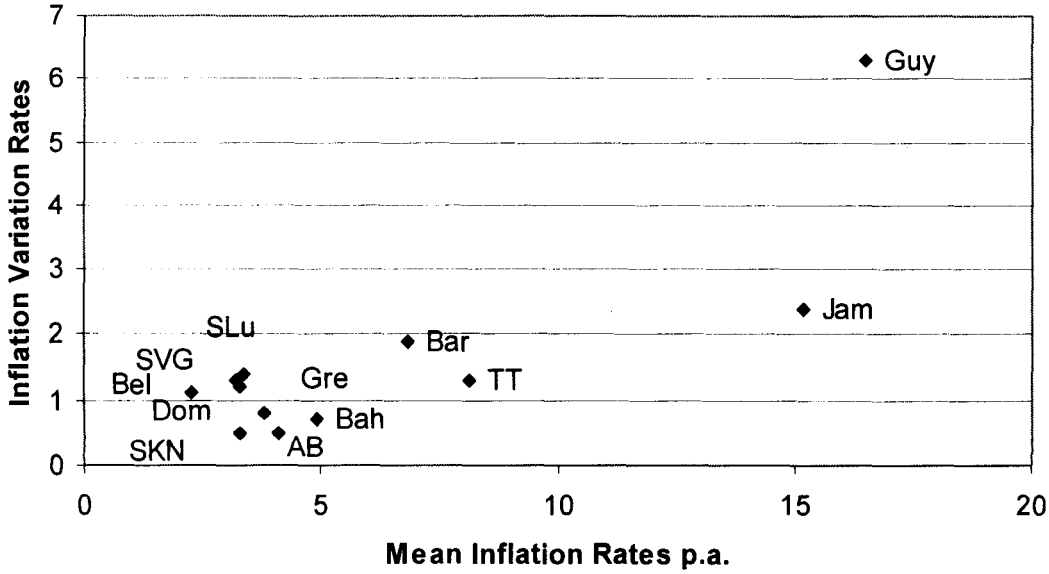


Figure 5. Mean Inflation and Inflation Variation



Unrestricted VAR

As seen at the beginning of the last section, the coefficients in the univariate representations reflect feedbacks through other variables. To investigate these feedbacks Vector Autoregressions (VARS) will be employed. Two simple forms, unrestricted and a long-run cointegrating relationship, will be considered. As observed above, there is also a trade-off between having a common specification versus getting the right specification for each country. Since the aim is to compare transmission mechanisms between the two groups it is worth starting with a common specification. The major objection to this is that in the ECCB and some other countries, two variables, the exchange rate and the interest rate, do not vary. Therefore it is useful to begin with a small standard monetary model in 3 variables, money, income and prices m_t, y_t, p_t and a trend. This can allow for a Phillips curve determining inflation in terms of deviation of output from its trend and a money demand curve, with inflation being taken as a measure of the opportunity cost of holding money. However, in the unrestricted VAR such a theoretical structure is not imposed and it is not clear that one would expect a traditional Phillips curve type relationship in these economies.

In this case, the VAR takes the form:

$$y_t = a_{10} + b_1 t + \sum_{i=1}^{p} a_{11i} y_{t-i} + \sum_{i=1}^{p} a_{12i} p_{t-i} + \sum_{i=1}^{p} a_{13i} m_{t-i} + u_{1t}$$

$$p_t = a_{20} + b_2 t + \sum_{i=1}^{p} a_{21i} y_{t-i} + \sum_{i=1}^{p} a_{22i} p_{t-i} + \sum_{i=1}^{p} a_{23i} m_{t-i} + u_{2t}$$

$$m_t = a_{30} + b_3 t + \sum_{i=1}^{p} a_{31i} y_{t-i} + \sum_{i=1}^{p} a_{32i} p_{t-i} + \sum_{i=1}^{p} a_{33i} m_{t-i} + u_{3t}$$

where trends are included. The first stage is to take the unrestricted VAR, with a maximum lag of four, and use the Akaike Information Criterion (AIC) to determine the lag length. This suggests *p=2* which is used below. Whether a particular variable is Granger-causal for the other variables can also be investigated. For instance, if prices were Granger non-causal with respect to output then all $a_{12i} = 0$ because past values of inflation do not help explain current values of output. Each variable is checked for Granger non-causal with respect to the other two variables, so the test for prices being Granger non-causal with respect to output and money involves testing $a_{12i} = 0$ and $a_{32i} = 0$. With two lags this implies four restrictions.

Table 3 gives the p values of the tests for Granger non-causality for each variable. A p value below 0.05 indicates that the column variable is a significant predictor of the other two variables at the 5% level. So for AB, money is a significant predictor of output and prices, but prices are not a significant predictor for money and output. In the case where the variables are I(1) the distributions of the test statistics are non-standard, so the tests can only be indicative.

Output is significantly Granger-causal for the other two variables in all but AB, SKN, SVG and Bah; the other two variables are less important for prediction. Money helps predict the other variables in only four countries: AB, Dom, Slu and Bah. Prices help to predict the other variables in five of the countries.

Table 3
Granger Non-Causality p Values

Countries	m	y	p
ECCB			
AB	**0.049**	0.060	0.070
DOM	**0.041**	**0.004**	0.386
GRE	0.126	**0.033**	0.100
SKN	0.103	0.803	**0.002**
SLU	0.004	0.001	**0.014**
SVG	0.135	0.088	0.187
Non-ECCB			
BAH	0.868	0.339	**0.053**
BAR	**0.011**	**0.000**	**0.002**
GUY	0.412	**0.005**	**0.000**
BEL	0.179	**0.002**	0.574
JAM	0.192	**0.003**	**0.001**
TT	0.222	**0.000**	0.124

Note: **Bold** figures are significantly Granger causal at 5%.

An unrestricted VAR of order two is estimated and the effect of two shocks reported: a money shock via orthogonalised impulse response functions and an inflation shock via generalised impulse response functions. These differ in the assumptions about the links between the shocks to different equations. The orthogonalised impulse response function assumes the variables form a causal chain in which output influences prices, and output and prices affect money, but there are no feedbacks within a period. The generalised impulse response function assumes that the correlation between the shocks is the same as it was over the sample period. Table 4 indicates that a one standard error shock to money in AB raises it by 2.5% and at the end of 50 quarters prices and output are 0.3% higher and money 0.5% higher. Table 5 suggests that a one standard error shock to prices increases them by 0.5%, and in the same period this makes output 0.1% lower and money 0.1% higher; after 50 periods the effect of this composite shock is to make prices, output and money higher by 0.3%, 0.2% and 0.4%, respectively.

Table 4
Unrestricted VAR: Orthogonalised Impulse Response Functions

Countries	1Se shock to money, percent					
	On impact			After 50 quarters		
	p	y	m	p	y	m
ECCB						
AB	0.0	0.0	2.5	0.3	0.3	0.5
DOM	0.0	0.0	3.6	0.0	0.0	0.0
GRE	0.0	0.0	3.3	0.0	0.0	0.0
SKN	0.0	0.0	4.1	0.0	0.0	0.0
SLU	0.0	0.0	2.6	0.0	0.2	0.3
SVG	0.0	0.0	3.3	0.0	0.1	0.1
Non-ECCB						
BAH	0.0	0.0	1.8	0.0	0.3	0.0
BAR	0.0	0.0	2.2	0.0	0.0	0.0
GUY	0.0	0.0	3.9	0.5	-0.1	0.2
BEL	0.0	0.0	2.6	0.0	0.0	0.0
JAM	0.0	0.0	3.7	-0.3	0.1	-0.3
TT	0.0	0.0	3.1	0.1	0.0	-0.1

These results provide evidence of short-run output costs to inflation across virtually all the countries, so overall inflation is associated with a short run reduction in output and is positively associated with the money supply. Table 5 shows that the short-run correlation between an inflation shock and output shock is negative, except for Gre where it is zero and Guy where it is positive, and that the short-run correlation between an inflation shock and money is positive, except for Gre, SVG, Bah, Bel and TT.

Table 5
Unrestricted VAR: Generalised Impulse Response Functions

Country	1Se shock to inflation, percent					
	p	y	m	p	y	m
ECCB						
AB	0.5	-0.1	0.1	0.3	0.2	0.4
DOM	1.1	-0.1	0.3	0.0	0.0	0.0
GRE	0.8	0.0	-0.7	0.0	0.0	0.0
SKN	0.9	-0.1	0.2	0.0	0.0	0.0
SLU	1.4	-0.3	0.1	0.0	-0.1	-0.2
SVG	1.2	-0.3	-0.3	0.0	0.0	-0.1
Non-ECCB						
BAH	0.6	-0.1	-0.3	0.1	0.8	0.1
BAR	1.3	-0.1	0.2	0.0	0.0	0.0
GUY	8.0	0.2	0.1	-1.1	-0.4	-1.1
BEL	1.0	-0.2	-0.2	0.0	0.0	0.0
JAM	2.2	-0.02	0.5	0.1	0.1	0.0
TT	1.2	-0.2	-0.1	0.1	-0.1	0.3

The long-run impact of a monetary shock is zero on all three variables for Dom, Gre, SKN, Bar and Bel; similarly the long-run effect of an inflation shock is zero for those countries – evidence of money neutrality in these cases. The ADF tests of Equation (1) suggested that the price level was I(0) for Gre, Slu, SVG, Bar and possibly Bel. This implies that inflationary shocks should die out to zero. The countries where the inflation shock is zero after 50 quarters are Dom, Gre, SKN, SLu, SVG, Bar and Bel, that is, the list where the inflation shocks die out contains the subset of those indicated by the ADF tests - which suggested that they should die out in Gre, Slu, SVG, and Bar, the cases where the price level was I(0). The inflation persistence noted for AB is here associated with 0.3% inflation after 50 quarters. The shocks do not die out in the cases of Guy, Jam, TT and The Bah. Overall, the estimates are consistent with the previous results, where the low inflation countries (ECCB, Bar, Bel) show evidence of inflation shocks that die out. The high inflation cases of Guy, Jam and TT reveal markedly different responses and AB and Bah lie somewhere in between. Where they are non-zero, the long-run effects are difficult to interpret. The issue of whether one

treats the variables as I(1), shocks persist, or I(0), shocks die out, is clearly crucial to the interpretation. Now let us examine the effect of treating the variables as I(1), shocks are persistent, and cointegrated, with a long-run money demand relationship.

To conduct the cointegration analysis the VAR can be written as a Vector Error Correction Model, VECM. It will be assumed that the three variables are I(1) and have a single cointegrating vector, interpreted as a demand for money function, where v_t is the trend adjusted velocity:

$$v_t = y_t + p_t + \beta_{3t} - m_t$$

Since r=1, the single, just identifying restriction that is needed is to normalise the logarithm of real money to have a coefficient of −1, but also to impose the over-identifying restrictions that y_t and p_t have unit coefficients. The trend has been restricted to enter the cointegrating vector, but the intercept is allowed to be unrestricted. This permits linear trends in the data, but precludes quadratic trends. Assuming a VAR (2) the system can then be written as:

$$\Delta y_t = \mu_1 + \alpha_1 v_{t-1} + \gamma_{11}\Delta y_{t-1} + \gamma_{12}\Delta p_{t-1} + \gamma_{13}\Delta m_{t-1} + u_1$$
$$\Delta p_t = \mu_2 + \alpha_2 v_{t-1} + \gamma_{21}\Delta y_{t-1} + \gamma_{22}\Delta p_{t-1} + \gamma_{23}\Delta m_{t-1} + u_2$$
$$\Delta m_t = \mu_3 + \alpha_3 v_{t-1} + \gamma_{31}\Delta y_{t-1} + \gamma_{32}\Delta p_{t-1} + \gamma_{33}\Delta m_{t-1} + u_3$$

The feedback coefficients α_i tell us how disequilibrium in the money demand feeds back on the three variables in the system. It would be expected that the lagged value of each variable would have a negative effect on its change, so $\alpha_1 < 0; \alpha_2 < 0; \alpha_3 > 0$. In systems with more cointegrating vectors, it is not simple to sign the adjustment coefficients. In this case there is a simple way to interpret the adjustment since ignoring the dynamics and errors

$$\Delta v_t = (\mu_1 + \mu_2 - \mu_3) + (\alpha_1 + \alpha_2 - \alpha_3)v_{t-1} + \ldots.$$

and the system is stable if $0 > \alpha_1 + \alpha_2 - \alpha_3 > -1$.

The Johansen trace 10% test identified 2 cointegrating vectors in Bar, Bel and TT, one in AB, Dom, Gre, Slu, SVG, SKN and Guy, none in Bah and Jam. On this basis it was assumed that there was a single cointegrating vector in each economy and the over-identifying restrictions were imposed. Although these were not rejected at the 5% level except in Bar and SKN, and at the 1% level only in AB, Dom, and Jam and TT, the asymptotic critical values are likely to cause over-rejection in small samples and the restrictions were maintained despite being rejected by the tests. In the output equation, nothing was significant except the lagged change in output. The ECM term in the money equation was significant and positive, as it should be, in half the cases and was insignificantly positive in the rest.

Table 6 gives the estimates of α_i and $\alpha = \alpha_1 + \alpha_2 - \alpha_3$, and r is the number of cointegrating vectors; cointegration requires significant feedbacks; significant (t>2) adjustment coefficients are shown in bold. There may be cointegration and no significant adjustment if the restricted cointegrating vector is not the right one. There is at least one significant adjustment coefficient everywhere except Slu, Bah (where there is no cointegration), Guy (where the coefficients in the price and money terms are just below 2) and TT. In Jamaica, where there is no cointegration, the error correction term, v_{t-1}, has a large and significant feedback on money. All the feedbacks to output have the right sign except in TT, where there is no significant adjustment. All the feedbacks to money have the right sign. Half the feedbacks to prices have the wrong sign (the correct sign is negative), and are significantly wrong in two cases, SKN and Bel. In all cases, the condition for stable adjustment in the system is met.

Table 6
Adjustment Coefficients

Countries	P	Y	M	a	r
ECCB					
AB	-0.010	**-0.047**	0.077	-0.134	1
DOM	**-0.096**	-0.025	**0.301**	-0.422	1
GRE	**-0.041**	-0.003	**0.099**	-0.143	1
SKN	**0.049**	-0.021	**0.160**	-0.132	1
SLU	0.006	-0.016	0.075	-0.085	1
SVG	0.041	-0.034	**0.209**	-0.202	1
Non-ECCB					
BAH	0.009	-0.033	0.026	-0.050	0
BAR	**-0.271**	**-0.075**	**0.341**	-0.687	2
GUY	-0.075	-0.001	0.042	-0.118	1
BEL	**0.053**	**-0.054**	0.039	-0.040	2
JAM	-0.038	-0.007	**0.133**	-0.178	0
TT	0.009	0.023	0.074	-0.042	2

Notes: a is the constant and r is the number of cointegrating vectors.
Significant adjustment coefficients are shown in bold.

To examine the response of the cointegrating VAR to shocks, again looking at both the orthogonalised impulse response to a pure money shock and the generalised impulse response to a price shock. By construction, shocks are permanent in this system, unlike the unrestricted VAR analysed earlier. The size of the shocks will also be different, because the standard errors in the restricted cointegrating system can be larger than those in the unrestricted VAR. The estimates are given in Tables 7 and 8.

Table 7
Cointegrating VAR

Country	Orthogonalised Impulse Response Functions, 1Se shock to money, percent					
	On impact			After 50 quarters		
	p	y	m	p	y	m
ECCB						
AB	0.0	0.0	2.7	1.1	1.7	2.8
DOM	0.0	0.0	3.7	1.0	0.5	1.6
GRE	0.0	0.0	3.5	1.6	0.1	1.7
SKN	0.0	0.0	4.3	-1.2	1.7	0.5
SLU	0.0	0.0	2.8	-0.2	1.3	1.2
SVG	0.0	0.0	3.3	-0.6	0.9	0.3
Non-ECCB						
GUY	0.0	0.0	4.9	3.6	0.5	4.1
BEL	0.0	0.0	3.0	-2.1	4.6	2.5
JAM	0.0	0.0	3.7	2.7	0.5	3.2
BAH	0.0	0.0	2.0	-0.5	1.6	1.1
BAR	0.0	0.0	2.3	1.0	0.4	1.4
TT	0.0	0.0	3.4	0.2	-3.6	-3.2

Table 8. Cointegrating VAR

Country	Generalised Impulse Response Functions, 1Se shock to inflation, percent					
	On impact			After 50 quarters		
	p	y	m	p	y	m
ECCB						
AB	0.5	-0.2	0.0	1.9	-0.7	1.2
DOM	1.3	-0.1	0.3	1.1	-0.3	0.8
GRE	0.9	0.0	0.0	1.2	-0.3	0.9
SKN	1.0	0.0	0.1	1.2	-0.6	0.7
SLU	1.6	-0.3	0.6	2.2	-0.5	1.7
SVG	1.4	-0.2	-0.2	1.9	-0.8	1.1
Non-ECCB						
BAH	0.7	-0.1	-0.2	1.4	-1.3	0.0
BAR	1.4	-0.1	0.5	2.0	-1.7	0.4
GUY	8.5	0.3	1.0	3.2	1.4	4.6
BEL	1.2	-0.3	-0.4	2.3	-2.3	0.0
JAM	2.4	0.0	0.6	8.2	-0.3	7.9
TT	1.4	-0.2	-0.1	2.1	0.3	2.4

Table 7 shows that a one standard error shock in AB raises money by 2.7%, and after 50 quarters prices, output and money are 1.1%, 1.7% and 2.8% higher, respectively. Table 8 depicts that a one standard error shock to prices in AB is 0.5%; this would be associated on average with a 0.2% reduction in output and a no increase in money in the same quarter. After 50 quarters, as those shocks worked through the system, prices would be 1.9% higher, output 0.7% lower and money supply 1.2% higher.

Notice that the effects on *p* plus *y* minus *m* sum to zero, because the cointegrating relationship constrains them. Across countries, the long-run effect on prices is greater than the short-run effect in all but two countries. This is the reverse of the pattern for the unrestricted VAR where long-run impacts were smaller. The exceptions are Guy and Slu. In the case of Guy, the price level rises immediately by 8.5%, carries on rising for a short time (not shown in the Table) then falls to its long-run level. This is almost certainly the constraining effect of the cointegrating vector (CV). By period 50 all of the countries have returned to their cointegrating relation given by satisfying the stability condition. The CV diverging in response to a shock shows differing speeds of adjustments, from the fastest estimate for Bar of -0.687 (corresponding to a half life of about 9 months) to the slowest for Bel of -0.040 (corresponding to a half life of approximately 10 years). The short-run effects of a shock to prices tend to be negative for output and positive for money (in 8 out of 12 countries in both cases). The long-run effects on output are negative in all countries except Guy and TT and to money are positive in all countries.

Conclusion

An examination of historical data suggests that the twelve countries analysed in this study can be divided into high-inflation countries, namely Jamaica, Trinidad and Tobago and Guyana, with the other nine as low-inflation countries. Three standard models are estimated to examine the monetary transmission mechanism - an autoregression, an unrestricted VAR, and a cointegrating VECM - to determine whether the estimates allow one to discern differences in policy, behaviour or performance among the countries. The results were interesting, but did not provide a clear-cut answer.

The autoregression results indicate differences among the countries' inflation performances, which may be attributed to policy responses conditioned by institutional structure. The estimates are able to show that the inflation experience of the ECCB countries, Belize, Barbados and The Bahamas with low mean inflation, low persistence and low variation contrast with that of Guyana and Jamaica, with Trinidad and Tobago falling somewhere between. The evidence from Granger non-causality tests suggests that income is broadly causal with respect to money and prices, but not the other way around. Estimates of the cointegration VECM provide evidence that inflation shocks are associated with falling income in the long run in ten of the twelve economies. This is supported by unrestricted VAR estimates that indicate inverse short-run output responses to inflation shocks. The system did not show monetary shocks being positively linked to prices and negatively related to output. However, the long-run inverse

relationship between price shocks and a decline in income was clear. This, it could be argued, may be linked to the argument of making inflation the primary macroeconomic target and a secondary role for intermediate targets (Loayza and Soto, 2002; Mishkin, 2000).

The estimates are not clear-cut. This may be due to the use of closed economy models and the fact that the balance of payments constraint is very likely a motive for monetary policy responses that seem to underlie differences in economic performances. Further research could explore whether one could construct a model based on the external constraint to inform policy responses and performance. This is difficult, since for nine of the countries there is no variation in exchange rates and little variation in interest rates.

3

Human Capital and Economic Growth: The Case of Barbados

Daniel O. Boamah

Abstract

The study utilises a traditional production function framework to measure the contribution of human capital (Education) to economic growth in Barbados over the period 1964-1993. The methodology decomposes the contribution of labour to economic growth into three components. The first accounts for the contribution to growth due to unskilled labour, while the second accounts for the contribution arising from the educational investment required to bring the skills of new entrants into the labour force to the country's average level of schooling. The third component refers to the contribution arising from increases in the overall level of schooling in Barbados. The main finding is that when this decomposition is applied to Barbados' data in the growth accounting process, labour's contribution explains nearly 50% of economic growth in the country over the period of investigation. This is more than double labour's contribution when such qualitative decomposition is ignored.

1. Introduction

Since the beginning of the decade of the 1960s, it has increasingly been recognized that the concept of accumulation need not be limited to technology and physical capital but is also applicable to the cluster of factors, including health, education, on-the-job training and general skills of the labour force, which is collectively referred to as human capital.

The pioneering work of Solow (1957) and Denison (1962) suggested that in the process of accounting for economic growth in the US economy, the traditional factors of physical capital and labour explained only a small fraction of the observed changes in output, leaving a substantial residual. As far as developing countries are concerned, studies by Williamson (1969) in the Philippines and Selowsky (1969) in Chile seem to suggest that the educational contribution to growth in these two countries, although not as large as was found by Denison (1962) for the United States, was nevertheless moderately significant. Physical capital

Bibliography

Alogoskoufis, George S. & Rob Smith. 1991. "The Phillips Curve, the Persistence of Inflation, and the Lucas Critique: Evidence from Exchange-Rate Regimes," *American Economic Review*, American Economic Association, Vol.81(5), pages 1254-75, December.

Atkins, Fiona and Derick Boyd. 1998. "Convergence and the Caribbean", *International Review of Applied Economics,* Vol. 12, No. 3, 1998, 381-396.

Blackman, Courtney. 1998. "Central Banking in Theory and Practice: A Small State Perspective", Caribbean Centre for Monetary Studies, Monograph (Special Studies) Series #26, The University of West Indies, St. Augustine, Trinidad & Tobago.

Clarida, Richard; Jordi Gali and Mark Gertler. 1999. "The Science of Monetary Policy: A New Keynesian Perspective", *Journal of Economic Literature* Vol. XXXVII, December, ppp.1661-1707.

ECCA. 1982. "East Caribbean Currency Authority: Its role and Functions in the Financial System", East Caribbean Currency Authority.

Fisher, Stanley. 2001. "Exchange Rate Regimes: Is the Bipolar View Correct?", *Journal of Economic Perspectives*, Vol. 15, No. 2, Spring 2001, pp.3-24.

Honohan, P. and P.R. Lane. 2000. "Will the Euro Trigger More Monetary Unions in Africa?", Research Paper 176, World Institute for Development Economics Research. http://ideas.repec.org/p/wop/wobaie/2393.html

IMF. 1998. *International Financial Statistics* (IFS_1298.cd), Washington, D.C.

Repse, Einars. 1999. *Monetary Policy in Latvia and Exchange Rate Strategies*, Mimeo, Bank of International Settlement. http://www.bis.org/review/r991115c.pdf

Rogoff, Kenneth. 1985. "The Optimal Degree of Commitment to an Intermediate Monetary Target," *Quarterly Journal of Economics 100* (November1985), 1169-1189.

Rose, Andrew K. 2000. "One Money, One Market: The Effect of Common Currencies on Trade", *Economic Policy*, Vol.15, Issue 30, 9-45.

Schuler, Kurt. 1992. Currency Boards, Ph.D. Dissertation, George Mason, University, Fairfax, Virginia. http://users.erols.com/kurrency/webdiss1.htm

World Bank. 2000. *World Development Indicators (wdi) CD-ROM*, Washington, D.C.

formation accounted for a much larger share of output growth than was normally observed in developed countries. Although most of the early studies on growth accounting attributed a large part of the unexplained residual to increases in the level of education of the labour force, with the possible exception of Selowsky (1969), no attempts were made to set out the framework by which such contribution could be measured. We attempt to do this in this paper.

The literature recognizes three main sources of economic growth: growth in the inputs of production (capital and labour, for instance), improvements in the efficiency of allocation of these inputs across activities and innovations that create new products and new uses of existing products that bring about increases in the productivity of inputs. The strong impact that education has on economic growth lies in the fact that it impacts directly on the latter two sources of growth. Education not only improves the ability of the labour force to work more efficiently with a given level of technology but it also enables the state of technology to advance more rapidly, leading to a faster introduction of more advanced production techniques.

The process of integrating knowledge acquisition into the theories of growth owes its genesis to Arrow (1962) but it was the modern growth theories, led by endogenous growth models of which Romer (1986) is the main proponent, that have popularised it. These latter theories recognize, *inter alia,* that the accumulation of knowledge is not only endogenously determined but knowledge itself may have an increasing marginal product.

While it is recognized that both human capital and physical capital, along with technological progress, provide the main impetus for economic growth, the determinants of human capital accumulation have attracted less attention in the literature than physical capital mainly because of the extreme difficulties of measuring the former.

Early attempts to measure the educational component of human capital made use of literacy rates and school enrolment ratios. While the latter may be considered an improvement on the former, both are rather unsatisfactory. Literacy rates capture only a basic level of overall education but ignore the fact that some people are much better educated than others. Similarly, school enrolment ratios measure future capital rather than the present.

The wage or income-based approach to human capital measurement avoids some of the pitfalls that come from equating levels of education directly with human capital. It is based on the idea that the amount of human a person possesses should be reflected in pay. The underlying assumption is that wage rates and therefore labour incomes are determined endogenously by the marginal productivity of the worker. The latter, in turn, is determined by all the exogenous characteristics (such as education, experience, health and cognitive skills), which define human capital. This approach also has its drawbacks but, in general, it represents a measure of improvement over the first two.

Barro and Lee (1993) and more recently, Mulligan and Salai-Martin (1995), provide recent examples of studies that have adopted this approach to measure human capital. This study is based largely on this approach.

The paper has two broad objectives:

(i) to provide a framework for measuring human capital (mainly educational capital) in Barbados, a country which has a tradition of high literacy rates as a result of significant investment in education.

(ii) to ascertain the contribution to economic growth of human capital, along with physical capital and 'raw' labour inputs.

The organization of the paper takes the following sequence: Section II outlines the theoretical framework underpinning the analysis; Section III deals with data sources and the empirical problem of generating the time series data necessary for the measurement of the contribution of human capital to growth. Section IV utilizes the framework of Section II and the information generated in Section III to measure past contributions of human capital to growth in Barbados. Finally, Section V concludes the paper with a brief summary and some remarks on possible policy implications.

II. Theretical Framework

Following Selowsky (1969) one can consider the contribution of human capital to growth as having two components:

(i) **The effect of increases in the educational level of the labour force.** This is the effect of increases in the level of schooling and general health of the labour force. This effect can be termed "human capital deepening", analogous to physical capital deepening in capital theory.

(ii) **The contribution of human capital that derives from maintaining the average level of schooling of the labour force.** This can be considered as the contribution of human capital that derives from the efforts to equip additions to the labour force with the same skills as the existing labour force. In this paper it is denoted as the "maintenance" component of human capital.

Most of the studies ignore the latter component of human capital contribution to growth but as Selowsky (1969) points out, its neglect tends to under-estimate human capital's contribution to growth and over-estimates the area of growth attributable to an increase in the number of workers.

The following section outlines the procedure for deriving the two components of human capital.

(i) The General Model

Consider an augmented neoclassical production function:

$$Y = F(K, L_0, L_i ... L_n, Z) \qquad (1)$$

where Y denotes aggregate output, K the flow of services of physical capital stock, and $(L_0, ... L_i, ... L_n)$, man-hour inputs of members of the labour force with o,... i,..., n years of schooling, respectively. Similarly, Z represents the contribution to growth of other factors such as external orientation, technology, etc. that may help explain output levels. Equation (1) is a modified form of Solow's 1957 growth model that has been used extensively by, among others, Selowsky (1969), Feder (1983), Ram (1987) and Lin (1994). By differentiating equation (1) with respect to time, rearranging terms, assuming that wages (W_i) reflect marginal productivities,[1] and writing Y', L_i' for $\frac{dY}{dt}, \frac{dL_i}{dt}$ etc., equation (1) could be transformed into an equation of the form:

$$Y' = f_k K' + w_O L' + \sum (w_i - w_O) a_i L' + L \sum w_i a_i' + f_z' \qquad (2)$$

In (2), the term $f_k K'$ is the contribution of physical capital to growth, $w_O L'$ is the contribution of the uneducated component of the labour force, while $\sum (w_i - w_o) \alpha_i L'$ is the contribution to output deriving from the effort to equip additions to the labour force with the same skills as the existing labour force. It represents the "maintenance" component referred to earlier.

Similarly, the term $L \sum_{i=0}^{n} W_i a_i'$ is considered as the contribution to growth due to changes in the relative distribution of workers by years of schooling weighted by the relative marginal products. It must be noted that as long as education creates external economies not captured by wage differentials the third and fourth terms in (2) would underestimate the true contribution of education. On the other hand, it would overestimate the contribution to the extent that innate ability, family connections, etc. are correlated with years of schooling.

Equation (2) may further be recast as:*

---

1 It should be noted that the assumption that wages paid the respective categories of labour reflect their marginal productivities is only made to simplify the analysis. The implied assumptions of a perfectly functioning labour market obviously do not hold in Barbados.

* Please see the Appendix for the full derivation of the model.

$$\frac{Y^{'}}{Y}=\frac{\alpha_k K^{'}}{K}+\frac{\alpha_b L^{'}}{L}+\frac{\alpha_e L^{'}}{L}+\frac{\alpha_q Q^{'}}{Q} \qquad (3)$$

where $\alpha_k=\frac{Kf_k}{Y}$ represents the share of physical capital in total output, $\alpha_b=\frac{W_O L}{Y}$ the share of the labour input in total output if every worker were uneducated and $\alpha_e=\frac{\left(\bar{W}-W_o\right)\dot{L}}{Y}$ the share attributable to educational widening in total output. The expression $\frac{Q^{'}}{Q}=\frac{\sum_{i=0}^{n} W_i a_i^{'}}{\bar{w}}$ also denotes relative changes in the index of educational deepening, and $\alpha_q=\frac{\bar{W}L}{Y}$ is the observed share of labour in output. R is a residual summarizing the contribution of other factors to the growth rate.

In discrete approximation of the time derivates one can re-write (3) as:

$$\frac{\Delta Y}{Y}=\frac{\alpha_k \Delta K}{K}+\frac{\alpha_b \Delta L}{L}+\frac{\alpha_e \Delta L}{L}+\frac{\alpha_q \Delta Q}{Q}+R \qquad (4)$$

Both parts of equation (4) can be computed for any time period for which data exist for output capital and labour, as well as for the respective shares of capital and labour.

The original decomposition as employed by Solow (1957) takes the form:

$$\frac{\Delta Y}{Y}=\alpha_k\frac{\Delta K}{K}+\alpha_l\frac{\Delta L}{L}+R^{'} \qquad (5)$$

Therefore, in essence, what the decomposition as outlined in (4) does is to split algebraically the original contribution of labour into three parts: first, the contribution to growth due to 'raw' labour force growth, second, the contribution attributable to the educational effort needed to bring new entrants to the national average level of education and thirdly, the contribution due to changes in the composition of the labour force by schooling, weighted by the respective marginal products.

III. Data Sources and Measurements

It can be seen from Section II that the weights for the changes in the schooling distribution of the employed labour force are relative wages by categories of educational levels achieved. The 1960 census report for Barbados puts the literacy rate at about 95%. That means that for the period of the analysis almost every member of the labour force would have attained at least a primary school level of education. Therefore it is not realistic to obtain the contribution of the labour

force in total output if every worker were uneducated. The paper therefore estimates the contribution to output as if every worker were educated up to the primary level.

Three categories of the labour force with different levels of skill and knowledge are identified: those with an educational level up to the primary school (L_1), those with secondary/technical and vocational training (L_2) and those with tertiary level education[2] (L_3). Data for these categories of educational levels are available from various census data as well as Labour Market Information Bulletins published by the Ministry of Labour. The median salaries for the country's civil servants for the three categories identified were assumed to reflect the wages and/or salaries paid to the respective categories in the overall economy.[3] These were assembled from various issues of the "Schedule of Emoluments" published annually by the Ministry of Finance. Information on gross capital formation and the labour force employed were obtained from the "Annual Statistical Digest of the Central Bank of Barbados, while data for the stock of capital was taken from Boamah (1984).

As explained in Section II, a_b represents the share of labour input in total output if every worker were only educated to the primary school level, a_q is the observed share of total labour input and a_k is the share of physical capital in total output. Similarly, a_e denotes the imputed share of labour input attributed to educational quality improvements beyond the primary school level.

As shown in equation (4) the measurements of a_b and a_q are straightforward. The expression for a_k was obtained residually as $\alpha_k = (1 - \overline{WL/Y})$. The variable "Q/Q represents the growth rate in the index of qualitative changes in the labour force but there are no readily available data on it. To obtain a series for this recall from equation (8) that:

$$\frac{\Delta Q}{Q} = \frac{\sum_{i=1}^{3} w_i a_i'}{\overline{W}} = \frac{1}{\overline{W}} \sum_{i=1}^{3} W_i \left(\frac{L_i}{L}\right)' \qquad (6)$$

through a process of differentiating $\left(\frac{L_i}{L}\right)$ with respect to time and rearranging terms, the expression of $\frac{\Delta Q}{Q}$ in equation (6) becomes:

---

2 To be classified in this category, a person must be a university graduate, at the minimum.

3 The assumption is made for convenience, in view of the total lack of published information, on wages and salaries paid in the private sector. Nevertheless, the relative wages by levels of education in the private sector are not likely to deviate substantially from those in the civil service.

$$\frac{\Delta Q}{Q} = \frac{1}{w} \sum_{i=1}^{3} w_i a_i \left(\frac{\Delta L_i}{L_i} - \frac{\Delta L}{L} \right) \tag{7}$$

$$or \quad \frac{\Delta Q}{Q} = \frac{W_1 a_1}{\bar{W}} \left(\frac{\Delta L_1}{L_1} - \frac{\Delta L}{L} \right) + \frac{W_2 a_2}{\bar{W}} \left(\frac{\Delta L_2}{L_2} - \frac{\Delta L}{L} \right) + \frac{W_3 a_3}{\bar{W}} \left(\frac{\Delta L_3}{L_3} - \frac{\Delta L}{L} \right) \tag{8}$$

Thus a series on " Q/Q can easily be derived from the available information on a_i

L_i', W_i *and* $\bar{W}$

Figure 1. Employment by Highest Level of Education

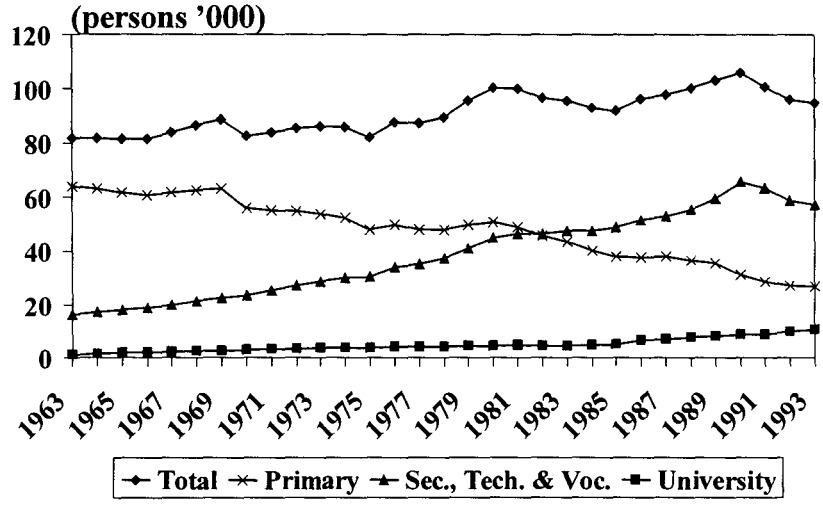


Figure 2. Real Wages by Highest Level of Education

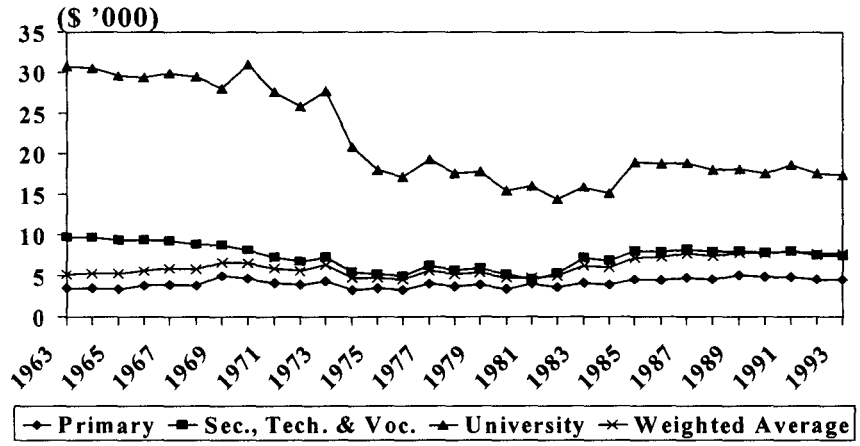


Table 1. Contributions to Growth in Barbados
(Without Accounting for Labour Quality)
Selected Years

Year	$\Delta Y/Y$	$\alpha_k (\Delta K/K)$	$\alpha_l (\Delta L/L)$	R
1965	0.13424	0.00139	-0.00477	0.13762
1968	0.05267	0.00966	0.02603	0.01698
1971	0.02779	0.02182	0.01294	-0.00697
1974	-0.02298	0.03124	-0.00067	-0.05355
1977	0.03596	0.02774	-0.00440	0.01262
1980	0.04395	0.03120	0.02664	-0.01281
1983	0.00491	0.01678	-0.00658	-0.00529
1986	0.05106	0.01571	0.03390	0.00145
1989	0.03597	0.01039	0.02291	0.00268
1993	0.00808	0.01055	-0.00935	0.00688
Average [a]				
1964-1993	0.04962	0.01484	0.00992	0.02487

***Note*[a]:** The Calculations of the average contributions cover the entire period of analysis and have been restricted to the period of positive rate of growth of output.

Table 2. Contributions to Growth in Barbados
(Accounting for Labour Quality)
Selected Years

Year	*ΔY/Y*	α_k *(Δk/k)*	α_b *(ΔL/L)*	α_e*(ΔL/L)*	α_q*(ΔQ/Q)*	*R*
1965	0.13424	0.00139	-0.00307	-0.00170	0.02987	0.10775
1968	0.05267	0.00965	0.01709	0.00894	0.02199	-0.00501
1971	0.02779	0.02182	0.00900	0.00393	0.01367	-0.02064
1974	-002298	0.03124	-0.00046	-0.00021	0.00642	-0.05997
1977	0.03596	0.02774	-0.00318	-0.00122	0.00391	0.00871
1980	0.04395	0.03012	0.01901	0.00763	0.00361	-0.01642
1983	0.00491	0.01678	-0.00434	-0.00224	0.00819	-0.01347
1986	0.05106	0.01571	0.02081	0.01309	0.02919	-0.02774
1989	0.03597	0.01039	0.01482	0.00808	0.00795	-0.00527
1993	0.00808	0.01055	-0.00545	-0.00389	0.01039	-0.00351
Average [a]						
1964-1993	0.04962	0.01484	0.00683	0.00309	0.01457	0.01030

Note [a]: The calculations of the average contributions cover the entire period of analysis and have been restricted to the periods of positive rates of growth of output.

Figure 1 represents the evolution of employed labour in Barbados by different levels of education for the period 1963 to 1993. As expected, with the exception of L_1 which decreased over the period, L_2 and L_3 increased on average. Figure 2 illustrates the time series behaviour of relative wages by level of education for the three classes identified. It demonstrates that over the period of investigation relative wages followed a declining trend, particularly for those individuals with higher levels of education.

Individuals with university level education received nearly six times the real average wage in 1963, but by 1993 they were paid only two and a quarter times the average wage. A logical explanation for this is that in 1963, individuals with university level education were relatively more scarce and hence received a higher wage premium. In later years, as proportionately more people acquired higher education, the wage premium gradually declined.

The relative wages of workers with only primary school education showed the least variation from the mean over the period of investigation. Those individuals received a little over 58% of the real average wage in 1993 compared with 69% in 1963 but it is noteworthy that in 1993 they received one-quarter the real wages of individuals with university level education compared with only one-ninth[4] in 1963.

IV. Empirical Results

The results obtained from applying Barbados' data to model (4) are presented in Tables 1 and 2. Table 1 presents the results of aggregating the labour force without taking explicit account of labour quality improvements.

Equation 5 was utilised, and a_k and a_l, the respective shares of capital and labour, were defined such that $a_k + a_l = 1$. The table suggests that for the period 1964 to 1993, out of an average growth rate of real output of 4.96%, increases in capital inputs accounted for 1.48% and labour 0.99%, leaving a residual averaging 2.49%. In other words, increases in capital inputs accounted for approximately 30% (0.0148/0.0496) of the growth rate of real output and labour approximately 20%, (0.0249/0.0496) leaving 50% (0.0249/0.0496) accounted for by other factors.

Table 2 presents the growth accounting results when the decomposition as outlined in equation (4) is utilised. In this decomposition, if the assumption of constant returns to scale is imposed, the implied value of α_k would take the form $\alpha_K = \left(1 - \frac{2\overline{WL}}{Y}\right)$. Given the range of values of $\alpha_l = \frac{\overline{WL}}{Y}$ of around 0.6 and 0.8, the estimated value for α_k would take on negative values, which obviously would not make economic sense. Therefore, on the basis of the 'Kaldorian-stylized' fact that factor shares show little variation over time (see McCombie 2001, p. 607) it was decided to keep the values of α_k unchanged in both scenarios. This implicitly assumes that the bulk of the unexplained original "Solow residual" is accounted for by enhanced human capital for a given level of labour force. It also implies that the decomposition as outlined in equation (4) exhibits increasing returns to scale (since $\sum_i \alpha_i > 1$). Again, this may be justified by the fact that a rising stock of basic knowledge steadily raises the productivity of labour and enhances increasing returns (Romer (1986)). The results in this scenario suggest that, on average, the contribution to real growth of unskilled labour (that is, if it were assumed that every worker were educated only to the primary level) during the period 1964-1993 was about 13.8% (growth rate 0.68%) and that arising from the efforts to equip new job entrants with just enough education to maintain the educational level of the entire work force as previously existed was approximately 6.2% (growth rate 0.31%). At the same time the contribution to growth as a result of qualitative improvements of the work force (human capital deepening) was a significant 29.4% (growth rate 1.46%). In sum, the total contribution to growth by labour when qualitative improvements are taken into account amounts to a significant 49.4% as compared with only 20% when labour quality improvements are ignored. Increases in capital inputs continue to contribute approximately 30% to the growth rate of real output. The residual in this case contributes only 20.8%, compared

---

4 Institutional facts such as the influence of labour unions may have been partly responsible for the declining wage differential between the least and highest educated workers.

with about 50% when one does not take labour quality improvements into consideration.

In other words, the residual or total factor productivity (see Jorgenson and Grilliches, 1967) becomes the most important factor explaining growth rates in Barbados if no account is taken of labour quality improvements. However, when one takes into consideration changes in increasing skills of the labour force, the effective contribution of labour to growth becomes greatly enhanced, explaining nearly half of the growth rate of output. Total factor productivity in this case accounts for only 20% of economic growth.

The point needs to be emphasized that qualitative improvements in the labour force which, based on the analysis, appear to have had a robust impact on economic growth in Barbados, are not a product of education alone. Factors like increasing health of the population, the social cohesiveness and the general work ethic of the Barbadian people would have played a part in shaping the collective human capital of the nation. Unfortunately, the impact of such factors cannot be easily isolated in a study of this nature.

V. Conclusion

The main conclusion from the paper is that human capital has contributed significantly to economic growth in Barbados over the period which consideration, 1964-93. The analysis also suggests that technical change over the period has largely been embodied in labour. This is consistent with an economy like Barbados which is famous for the high investment in education and which boasts a literacy rate of over 90%. Indeed, over the period 1973 to 1996-97, Government spending in education ranged between 17% to 21% of total Government expenditure, the highest among the social expenditure categories.

The results of the study have some policy implications. However, given the rather simplifying assumptions about the nature of both the factor and product markets, the results need to be seen more as indicative rather than prescriptive. Naturally, in an economy like Barbados where the tradition of negotiating wages through a bargaining process between the unions and employers has been the norm for virtually the entire period of the analysis, the assumption that labour is paid the value of its marginal product is likely to be violated. More often than not, the possibility exists that labour could get more than its marginal product, especially among those categories of labour with lower levels of education. To that extent, the estimated share of the value of production assigned to labour may be over-estimated, as will the estimated contribution attributable to human capital.

The results could be adjusted by re-casting the analysis within the framework of imperfect competition in both the factor and product markets. However, given the virtual lack of information on the appropriate elasticities of demand, especially for labour among the various categories identified, such an approach may not lead to any more accurate estimates of the contribution of human capital to growth than those attained in the study.

Despite these caveats, we believe the results are of sufficient merit to be disseminated and to be used as a guide for policy.[5]

Physical capital has traditionally been subsidized in Barbados by way of fiscal incentives because of its perceived importance in stimulating economic expansion. The results of this study suggest that investment in human capital is an equally effective way to stimulate economic growth so that public policy to upgrade the labour force should continue to receive high priority in the country's development strategy.

Nevertheless, while general education is obviously beneficial, it would not be accurate to suppose that simply increasing the aggregate amount of 'education' will be sufficient to raise productivity further. Indeed, recent research findings (see Barro, 2001) suggest that of all the disciplines, science and mathematics appear to have the strongest impact on economic growth in the US. To that extent, it is necessary for public policy on education in Barbados to identify what kinds of educational activities are likely to be more growth-enhancing and emphasise them, perhaps with some sort of incentives. Policy makers ought also to be aware of the economic cost of supporting other types of education whose justification may not necessarily be on economic grounds.

---

5 A similar approach was used to study the contribution of changes in the quality of the labour force to economic growth in Chile (see Solowsky, 1969) and in Greece (see Bowles, 1971) over the decade of the 1950s. We believe that over the period of analysis of this study, the Barbados labour force shared similar characteristics to Chile and Greece over the decade of the 1950s.

References

Arrow, K.J. "The Economic Implications of Learning by Doing". *Review of Economic Studies,* Vol. 29, 1962.

Barro, Robert J., "Human Capital: Growth, History and Policy", *American Economic Review,* 91:2 May 2001, 12-23.

Barro, Robert J. and J. Lee, "International Comparisons of Educational Attachment", *Journal of Monetary Economics, 32:3,* December 1993, 363-394.

Boamah, Daniel, "The Stock of Fixed Capital in Barbados, 1958-81: Some exploratory Estimates", *Economic Review,* Central Bank of Barbados, December 1984, 8-20.

———. "An Approach Towards the Measurement of Human Capital in Barbados", Working Papers, Central Bank of Barbados, 1995, 178-184.

———. "Savings and Investment in the Barbados Economy", *Economic Review,* Central Bank of Barbados, XXIII: 1 December 1996, 46-50.

Bowles, Samuel, "Growth Effects of Changes in Labour Quality and Quantity, Greece: 1951-1961", in Hollis B. Chenery (Ed), *Studies in Development Planning,* Harvard University Press, Cambridge, Massachusetts, 1971.

Denison, E.F., "Sources of Economic Growth in the United States", New York: Committee for Economic Development, 1962.

Feder, G., "On Exports and Economic Growth", *Journal of Development Economics,* February-April 1983, 57-73.

Jorgenson, Dale W. and Z. Grilliches, "Explanation of Productivity Change", reprinted in Amartya Sen (Ed.), *Growth Economics,* Penguin Books Ltd., Harmondsworth, England, 1970.

Lin, S., "Government Spending and Economic Growth", *Applied Economics, 26,* January 1994, 83-84.

Mankiw, N. Gregory, David Romer and David N. Weil, "A Contribution to the Empirics of Economic Growth". *Quarterly Journal of Economics, 107:2, 1992,* 407-438.

McCombie, J.S.L., "What Does the Aggregate Production Function Show? Further Thoughts on Solow's Second Thoughts on Growth Theory." Journal of Post Keynesian Economics, 23:4, Summer 2001, 589-615.

Mulligan, C.B. and X. Sala-i-Martin, "A Labour-Income-Based Measure of the Value of Human Capital: An Application to the States of the United States". Economic Growth Center, Yale University, Discussion Paper No. 722, December 1994.

Ram, R., "Government Size and Economic Growth", *American Economic Review, 76*, March 1986, 191-203.

Romer, Paul M., "Increasing Returns and Long-Run Growth", *Journal of Political Economy, 94:5, 1986,* 1002-1037.

Solow, Robert M., "Technical Change and the Aggregate Production Function", *Review of Economics and Statistics, 39*, August 1957, 312-320.

Selowsky, Marcello, "On the Measurement of Education's Contribution to Growth", *Quarterly Journal of Economics, 83:3*, 449-463, 1969.

Williamson, J.G., "Dimensions of Post War Philipine Economic Progress", *Quarterly Journal of Economics, 83:1*, 1969, 93-109.

Appendix 1

The following section outlines the procedure for deriving the two components of human capital.

1. *The General Model*

Consider an augmented neoclassical production function:

$$Y = F(K, Lo, Li \ldots Ln, Z) \qquad (1)$$

where Y denotes aggregate output, K, the flow of services of physical capital stock, and $Lo, Li \ldots ln$, man-hour inputs of members of the labour force with $(o,i \ldots n)$ years of schooling, while Z is an error term.

By differentiating equation (1)' with respect to time and writing Y', L_i' respectively for $\frac{dY}{dt}, \frac{dLi}{dt}$ etc. one can rewrite equation (1) as:

$$Y' = f_k K' + f_{l0} L_i' + f_{li} L_i' + \ldots + f_{\ln} L_n' + f_z Z' \qquad (2)$$

where f_k, f_{li} represent the marginal productivities of physical capital $\left(\frac{\partial F}{\partial K}\right)$ and labour with i years of schooling $\left(\frac{\partial F}{\partial L_i}\right)$, respectively. Assume that wages reflect marginal productivities; then

$$Y' = f_k K' + \sum_{i=o}^{n} w_i L_i' + f_z Z' \qquad (3)$$

In equation (3), W_i is the real wage of individuals with i years of schooling.

$$Let\ L = \sum_{i=o}^{n} L_i, \quad therefore\ L' = \sum_{i=0}^{n} L_i'$$

Thus one can write equation (3)' as

$$Y' = f_k K' + Wo L' + \sum_{i=0}^{n} (Wi - Wo) L_i' + f_z Z' \qquad (4)$$

From equation (4)¢, the expression $\sum_{i=0}^{n}(W_i - W_o)L'$ may be written as:

$\sum_{i=0}^{n}(W_i - W_O)(a_i L)'$ which, in turn, becomes

$$L'\sum_{i=0}^{n}(Wi - W_O)a_i + L\sum_{i=0}^{n}W_i a_i' - W_O L\sum_{i=0}^{n}a_i' \quad \left(\text{since } (a_i L)' = (La_i' + L'a_i)\right) \tag{5}$$

By definition $\sum_{i=0}^{n}a_i = 1$ and hence $\sum_{i=0}^{n}a_i' = 0.$

Therefore one can write equation (4)' as

$$Y' = f_k K' + W_o L' + \sum_{i=0}^{n}(W_i - W_o)\, a_i L' + L\sum_{i=0}^{n}W_i a_i' + f_z Z' \tag{6}$$

and hence $$\frac{Y'}{Y} = \frac{f_k K'}{Y} + \frac{W_o L'}{Y} + \frac{L'\sum_{i=0}^{n}(W_i - W_o)a_i}{Y} + \frac{L\sum_{i=0}^{n}W_i a_i'}{Y} + \frac{f_z Z'}{Y} \tag{7}$$

Let the average wage, $\overline{W} = \sum_{i=0}^{n}W_i a_i$

Therefore $\sum_{i=0}^{n}(W_i - W_o)\, a_i = (\overline{W} - W_o)$, since $\sum_{i=0}^{n}a_i = 1$

Hence equation (7) becomes

$$\frac{Y'}{Y} = \frac{Kf_k K'}{YK} + \frac{LW_o L'}{YL} + \frac{L}{Y}(\overline{W} - W_o)\frac{L'}{L} + \left(\frac{\overline{W}L}{Y}\right)\frac{\sum_{i=0}^{n}W_i a_i'}{\overline{W}} + \frac{f_z Z'}{Y} \tag{8}$$

$$or \quad \frac{Y^{'}}{Y} = \frac{\alpha_k K^{'}}{K} + \frac{\alpha_b L^{'}}{L} + \frac{\alpha_e L^{'}}{L} + \frac{\alpha_q Q^{'}}{Q} + R \qquad (9)$$

In discrete approximation of the time derivates one can re-write (9) as:

$$\frac{\Delta Y}{Y} = \frac{\alpha_k \Delta K}{K} + \frac{\alpha_b \Delta L}{L} + \frac{\alpha_e \Delta L}{L} + \frac{\alpha_q \Delta Q}{Q} + R \qquad (10)$$

4

Financing Growth and Development in the Caribbean - The Role of the Caribbean Development Bank

Patrick Kendall, Carl Howell, Marco Petracco,
Ian Durant and Elmer Harris

Abstract

The study reviews the policies and operations of the Caribbean Development Bank during 1970-2000. The review begins with an analysis of the economic and social conditions that motivated the establishment of the Bank and the development challenges that confronted the Bank during its three decades of operations. The study reviews the various sources and types of financial resources together with the sectoral and geographical distribution of allocations over the period. It concludes with identification of a number of challenges facing the Bank in the medium to long term such as the continuing problems of unemployment and poverty, the lack of international competitiveness of major exports, the Bank's lack of capacity to fund structural adjustment programmes, the need for efficient development and management of economic and social infrastructure, the AIDS epidemic and the skills required to meet the challenge of globalisation.

Introduction

The Caribbean Development Bank (CDB) initiated operations in January 1970. According to Article I of the Bank's Charter, the purpose of the Bank is the pursuit of the harmonious economic growth and development of the member countries together with the promotion of economic cooperation and integration, special emphasis being placed on the needs of the

---

* List of Abbreviations can be found in the Appendix.

less developed countries (LDCs).[1] As indicated in Article II of the Bank's Charter, this is to be achieved through:

(a) the mobilisation of regional and extraregional resources for regional development;

(b) funding of development projects and programmes;

(c) provision of technical assistance (TA) especially as regards project identification and preparation;

(d) the stimulation of public and private investment;

(e) cooperation in the development of regional and locally-controlled financial institutions; and

(f) the expansion of international trade, especially intra-regional trade.

The paper reviews the role of CDB in the provision of development financing in the Region during the period 1970 to 2000. The review begins with a presentation of the development context that motivated the establishment of the institution. The second section looks at the evolution of CDB policy as the institution attempted to address the changing development challenges that confronted the Region. Section III reviews the role of the Bank as financial intermediary, discussing the various sources of financing and analysing broadly the structure of its allocations. Section IV reviews the sectoral allocations, presenting and evaluating CDB's strategic thrusts in the various sectors. Section V takes a critical look at CDB's operations during the 1970-2000 period, identifying lessons learnt and prospective challenges and changes for the medium term.

In the study, no attempt is made to quantify the impact of CDB's interventions on growth and development of its Borrowing Member Countries (BMCs). In fact, such a study would be impossible, given the number of players (Governments, other multilateral institutions besides the CDB, bilateral donors, private sector creditors, etc.) involved in the BMCs, all impacting in some way on growth and development. The data requirements for such a study would be extraordinarily large, if in fact such data are even available, and disentangling the impact of individual players would be impossible. Even at the project level, isolating the impact on growth and development is difficult. Given the level of aggregation involved in this study, the challenge would be substantially greater. Accordingly, the approach taken is a simple but useful one. The study merely focuses on the

---

1 The more developed countries (MDCs) in CDB's categorzation currently are the Bahamas, Barbados, Jamaica, Trinidad and Tobago and Guyana. The LDCs are the remaining BMCs - Anguilla, Antigua and Barbuda, Belize, British Virgin Islands, Cayman Islands, the Commonwealth of Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and the Turks and Caicos Islands.

increasing level of resources provided by the CDB during the 1970 to 2000 period, the sectoral distribution of those resources and the motivators for such a distribution. The underlying assumption always is that the allocation of resources at any time is a response to the changing development needs facing the Region, a point which the study highlights throughout. In so doing, the Bank was carrying out its mandate of contributing to the growth and development of its BMCs.

I. DEVELOPMENT CONTEXT

The rationale for the establishment of the Bank was the state of underdevelopment that characterized the Region in the sixties. While the decade witnessed an expansion in output, growth was often highly variable. For example, annual real Gross Domestic Product (GDP) growth in Barbados during 1962 to 1970 averaged 6.6% ranging from a low of 2.5% in 1965 to a high of 11.7% in 1968. In the case of Jamaica, the average for the period was 5.3% ranging from a low of 2.0% in 1962 to a high of 7.7% in 1970.[2] In the Organisation of Eastern Caribbean States (OECS), while real income expanded at a reasonable rate in some countries (Antigua, St. Lucia, Grenada), others experienced virtual stagnation (St. Vincent and the Grenadines, St. Kitts and Nevis). For the OECS Region as a whole, real income growth was moderate and per capita income at $300 in 1971 was among the lowest in the Western Hemisphere.[3] In the case of Guyana and Belize, per capita incomes at $384 and $408 (1973) were slightly better. Barbados ($765), Jamaica ($793) and Trinidad ($843) had per capita incomes that were substantially better.[4] However, skewed income distribution in these as in other economies of the Region made the economic and social realities worse than the per capita estimates would suggest.

Very importantly also, the engine of growth, namely the agriculture sector, and particularly export agriculture (mainly sugar and bananas) was beginning to sputter. With the fall in agriculture output, as noted below by Sir Arthur Lewis, the contribution of the agriculture sector to economic activity had declined substantially in most countries in the decade of the sixties. In the case of Guyana, the contribution of the agriculture sector (including forestry and fishing) to GDP (at current factor cost) declined from 26.2% in 1960 to 19.3% in 1970. In particular, the performance of export agriculture which dominated the sector had begun to wane. The contribution of sugar declined from 13.4% to 9.2% of GDP. In the case of Jamaica, the agriculture sector's contribution declined from 12.0% of GDP in 1960 to 7.9% in 1970. In some of the OECS countries, the decline was much more dramatic. In Antigua, the contribution of the agriculture sector plummeted from 26.9% in 1960 to less than 5.0% in 1970. In Grenada,

---

2 International Monetary Fund (IMF), Financial Statistics Yearbook, 1992, p.150.

3 World Bank, The Economic and Social Development of the Leeward and Windward Islands, Vol II, June 1975, p. i.

4 IMF, Financial Statistics Yearbook, 1992.

the fall was from approximately 53.0% in 1960 to 23.8% in 1970. In St. Kitts and Nevis, St. Vincent and the Grenadines and St. Lucia, the magnitudes of the decline were similar.[5] At the same time, there were rising concerns about the size of the Region's annual food import bill which eventually reached $0.5 billion (bn) in 1974.[6] OECS countries, which were substantially more dependent on agriculture, had witnessed dramatic changes in the contribution of the sector to GDP.

Meanwhile, the manufacturing sector, which was not large, and which at one time was touted potentially as the new engine of growth à la Singapore, never fulfilled this role. Many reasons have been presented for this failure, reasons that are relevant to this day. They include, among others, the lack of technical and managerial skills, an inadequate raw material base, diseconomies of scale due to small domestic markets, high levels of protection that inhibited the development of efficient, competitive industries etc. In Barbados, Guyana, Jamaica and Trinidad and Tobago, the contribution of manufacturing to GDP during the sixties hovered between 10% and 12%. In the OECS, the contribution was significantly less. With the exception of Dominica and Antigua, the contribution of the manufacturing sector to GDP was less than 5%. In the case of Dominica, the manufacturing sector's contribution stagnated between 7% and 8%. Antigua and Barbuda was the sole exception in that the contribution of its manufacturing sector climbed from 1.9% of GDP in 1960 to 10.2% in 1970. In his speech to the first CDB's Board of Governors' Meeting in Antigua on April 23, 1971, Sir Arthur Lewis declared:

> *"Agriculture is in a bad way; sugar, bananas, cotton and foodstuffs have all declined. The fisheries show signs of exhausting and livestock output is not keeping up with demand. In manufacture, very little is stirring."*[7]

In the case of those countries that were able to replace the decline in agricultural production with growth in mining activity (Jamaica, Guyana, Trinidad & Tobago), real GDP growth continued to be buoyant. However, the capital intensive and enclave nature of the mining sector left unaddressed the problem of urbanisation, growing unemployment and rising poverty levels. While tourism was able to absorb some of the excess labour for the agriculture sector, it also created problems for agriculture, pushing costs upwards through its impact on the real wage.

---

5 The World Bank, The Commonwealth Caribbean, The Integration Experience, John Hopkins University Press, Baltimore, 1978.

6 CDB, Statements by the President, 1971-80, p.48.

7 *Ibid.*, p.7

The unemployment rate in the CARICOM Region in April 1970 was estimated at 17.0% ranging from a low of 5.0% in Belize to a high of 23.0% in Trinidad and Tobago.[8] While estimates of unemployment remained relatively low for many countries, labour force participation rates had declined significantly between 1960 and 1970. In a sample of 11 current BMCs, the average labour force participation rate declined from 61.5% in 1960 to 53.4% in 1970.[9] Available social indicators for the period also paint a picture of considerable social sector underdevelopment and deprivation. Infant (under one year) mortality rates at the beginning of the seventies in the four MDCs ranged from 37 per thousand live births in Trinidad and Tobago to 42 per thousand in Jamaica. In a number of the LDCs, the rates were considerably higher. In Dominica and St. Kitts and Nevis, the numbers were 56 and 59, respectively. In St. Vincent and the Grenadines, there were 95 deaths per thousand live births. In Guyana and Barbados, close to 20.0% of children under five years were malnourished. In St. Vincent & The Grenadines, the figure was closer to 30.0%.[10]

The Region was also undergoing at this time the very important transition from colonial to Independent States. By 1966, Barbados, Guyana, Trinidad and Tobago and Jamaica were independent and other member-states were about to follow. Under colonial rule, the Region received substantial funding from the United Kingdom for budgetary support and capital development. Canadian aid had also financed a substantial portion of public sector investment. With the coming of independence, it was not irrational to assume that such aid would not be forthcoming or be substantially reduced. At the same time, the rising expectations of welfare enhancement meant additional demands on Governments for various types of infrastructure and services in economies that were starved of domestic savings. The lack of domestic savings and heavy dependence on foreign savings were particularly acute in the smaller territories.

The insertion of CDB into this environment was therefore motivated by a few central concerns:

(a) the need to at least maintain but, more importantly, increase investment levels, particularly through external funding;

(b) imperative of stimulating growth, given the crisis in agriculture and lack of dynamism in the manufacturing sector;

(c) need to diversify the Region's economic base and particularly its export sector, given the vulnerabilities of its narrow production structure;

---

8 The World Bank, The Commonwealth Caribbean, 1978, p.259.

9 Ibid., p.246. The countries listed were Jamaica, Trinidad and Tobago, Guyana, Barbados, St. Lucia, Grenada, St. Vincent, Dominica, St. Kitts, Montserrat and Belize.

10 *Ibid.*, p. 269.

(d) high levels of unemployment, poverty and inadequate social sector development;

(e) the responsibilities of self-government thrust upon new political elites now faced with the rising expectations of improved social welfare on the part of their newly enfranchised populations; and

(f) a desire on the part of the newly independent and (soon to be independent) nations to chart a new economic course that was less dependent on their colonial masters and one that was more inward-looking, one with a greater regional focus as indicated by the establishment of the Caribbean Free Trade Area (CARIFTA) in 1968.

II. THE CHANGING ENVIRONMENT AND CDB POLICY

CDB in the Seventies

With initial paid-up capital of $25 million (mn) and callable capital of $25mn, CDB began in 1970 its mission of funnelling development resources to the Region. During 1970-80, the Bank approved net loans, contingently recoverable loans, grants and equity totalling $283.0mn (see Table 1). The stimulation of growth was a major concern of the Bank as made clear by several references in CDB's Presidential speeches to the production crisis in the Region. Close to 50.0% of the Bank's funding in the decade went directly and indirectly to the productive sector (agriculture, manufacturing, tourism, mining) and the pursuit of a diversified economic structure for the Region.[11] There was also a growing realisation that stable growth required, in particular, a more diversified export sector. Hence the seventies witnessed the Bank's focus not only on the regeneration of the agriculture sector but also support for tourism and manufacture development targeted at regional and extraregional markets. For the entire decade, the stimulation of economic growth remained the CDB's primary focus. The majority of resource allocations went directly to the productive sector with smaller allocations to economic (transport, power and energy and water) and social (education, health and housing) infrastructure development. According to the Bank's management, infrastructure development was only to be undertaken in support of productive sector activity.[12] Economic infrastructure, however,

---

11 Direct lending refers to lending to the ultimate users of funds while indirect lending is lending to users through financial intermediaries, particularly Development Finance Corporations (DFCs). Most of the AIC (Agricultural, Industry and Commerce) loans to the DFCs have been allocated to the productive sector.

12 *Ibid.*, pp. 56, 97, 169.

Table 1. Net Loans, grants Contingent Loans, Equity $('000)

	1970-80	1981-90	1991-2000	1970-2000
Productive Sector	**94,984**	**130,489**	**119,423**	**344,896**
Agriculture	36,537	38,399	37,036	111,972
Mining	235	3,222	35,153	38,610
Manufacturing	51,266	64,971	16,457	132,694
Tourism	6,946	23,897	30,777	61,620
Economic Infrastructure	**81,921**	**191,925**	**330,662**	**604,508**
Transport	61,798	121,411	255,739	447,709
Power	10,312	24,211	35,938	70,461
Water	9,811	38,028	38,499	86,338
Communications	0	8,275	486	8,761
Social Sector	**27,585**	**28,154**	**172,014**	**227,753**
Housing	10,280	3,080	13,564	26,924
Health	4,391	8,225	30,921	43,567
Education	12,914	16,819	127,529	157,262
Multi-Sector	**18,373**	**101,385**	**201,037**	**320,795**
Financial Sector	**60,104**	**121,127**	**238,961**	**428,192**
o/w:Agriculture	19,016	27,000	24,907	70,923
Manufacturing	5,498	25,400	9,065	39,963
AIC*	16,202	43,251	126,397	185,850
MSE**	0	0	6,625	6,625
Mortgage Finance	16,471	20,527	37,392	74,390
Student Loans	2,917	12,949	34,575	50,441
Total	**282,967**	**581,080**	**1,062,097**	**1,926,144**
		Percentages		
Productive Sector	**33.6**	**22.5**	**11.2**	**17.9**
Agriculture	12.9	6.6	3.5	5.8
Mining	0.1	0.6	3.3	2.0
Manufacturing	18.1	11.2	1.5	6.9
Tourism	2.5	4.1	2.9	3.2
Economic Infrastructure	29.0	33.0	31.1	31.4
Transport	21.8	20.9	24.1	22.8
Power	3.6	4.2	3.4	3.7
Water	3.5	6.5	3.6	4.5
Communications	0.0	1.4	0.0	0.5
Social Sector	9.7	4.8	16.2	11.8
Housing	3.6	0.5	1.3	1.4
Health	1.6	1.4	2.9	2.3
Education	4.6	2.9	12.0	8.2

Table 1. Net Loans, grants Contingent Loans, Equity - Cont'd
$('000)

	1970-80	1981-90	1991-2000	1970-2000
Multi-Sector	6.5	17.4	18.9	16.7
Financial Sector	21.2	22.2	22.5	22.2
o/w:Agriculture	6.7	4.6	2.3	3.7
Manufacturing	1.9	4.4	0.9	2.1
AIC*	5.7	7.4	11.9	9.6
MSE**	0.0	0.0	0.6	0.3
Mortgage Finance	5.8	3.5	3.5	3.9
Student Loans	1.0	2.2	3.3	2.6
Total	**100.0**	**100.0**	**100.0**	**100.0**

Source: CDB.

* AIC - Agriculture, Industry and Commerce.
** MSE - Micro and small Enterprises

received $81.9 mn or 29% of total CDB allocations for the period. While there was recognition of the low level of social sector development, it was recommended that expenditure on social sector infrastructure be reserved largely as the domain of national governments and/or aid donors since projects in the sector were not self-liquidating. Direct and indirect allocations to the social sector amounted to $47mn or 16.5% of CDB's total allocations for the decade. Much of the social focus of the Bank centred around the problem of unemployment and particularly youth unemployment to which a logical response was the stimulation of growth.[13] However, by the end of the decade, it was clear that more was needed to address unemployment and poverty. The response was the establishment in June 1979 of the first tranche of the Basic Needs Trust Fund (BNTF I), targeted at helping poor communities through the maintenance and expansion of social and physical infrastructure (schools, health clinics, roads, pathways, bridges etc.). An important objective of the programme was the provision of short-term employment in these communities.

The decade witnessed also CDB's very strong support to economic integration of the Region as one of the cornerstones of growth and development. The evolution of CARIFTA into CARICOM in July 1974 provided an ideal opportunity to push forward the integration process. Accordingly, CDB during the decade was intensely involved in the preparation and funding of various regional projects including the West Indian Shipping Company (WISCO) and the Leeward Islands

13 *Ibid.*, pp. 16,23

Air Transport (LIAT). The Regional Food Plan, which, among other projects, included the Corn and Soya Bean project in Guyana and Belize, three fisheries projects and the establishment of the Caribbean Food Corporation, was intended to stimulate growth and diversification of the agriculture sector.[14] Substantial consideration was also being given to regional industrialisation as exemplified, for example, by the proposed establishment of a regional cement company with Guyanese and Barbadian participation and of a regionally-owned aluminium smelter with participation by Guyana, Trinidad & Tobago and Jamaica. With the primary objectives of growth stimulation, the broadening and strengthening of the Region's economic base, the Bank placed much emphasis on the development of production complementarities across the Region in pursuit of scale economies and opportunities for import substitution at the regional level, together with the expansion of intra- and extraregional trade. By the end of the decade, however, many of these initiatives had fizzled out and given way to more national concerns as countries battled with the fallout from the energy and food crises of the seventies. Under pressure of high energy and food prices, inflation skyrocketed, external imbalances worsened, economic growth waned and fiscal deficits ballooned forcing countries to be much more inward looking and defensive in their policy postures. The Bank responded to the crisis through support for the establishment of the World Bank-sponsored Caribbean Group for Cooperation and Development, intended to channel funds to aid in the adjustment process. By the end of the decade, structural adjustment was becoming a major concern.

CDB in the Eighties

The second oil crisis in the 1979-80 period, together with world recession during 1981-3, placed considerable burden on CDB's BMCs. Deterioration in prices of the Region's major export commodities (sugar, bananas, bauxite/alumina) led to further balance of payments problems and pressure on foreign reserves which in many cases became a major constraint to growth and development. An important difference as compared with the previous decade was that the economic deterioration was much more widespread, encompassing eventually even Trinidad and Tobago which had benefitted from the escalation in oil prices. In the decade of the eighties, most countries were, in fact, forced to engage in some form of structural adjustment.[15] The Bank was increasingly drawn inevitably into the structural adjustment issues that prevailed in the eighties.

CDB responded by entry for the first time into the structural adjustment arena with a loan of $3mn to the Commonwealth of Dominica in 1987 as part of a programme financed jointly with the IMF and the World Bank. The Bank made it clear that while it considered structural adjustment a necessity, it did not have the resources to address the issue in the Region in a significant way, seeing its role essentially as being an advocate for the transmission of substantial

---

14 *Ibid.*, p. 101.

15 CDB, Statements by the President, 1980-9, p.190.

concessionary resources to the affected countries to finance the adjustment process with itself playing a supporting but minor role.[16]

Also, very importantly, the Bank began to dilute its involvement in direct funding of productive sector activity in favour of infrastructure development. The argument used was that financing for the productive sector was now more available through the DFCs and other financial intermediaries.[17] Economic infrastructure received 33.0% of the allocations for the decade, up from 29.0% (1971-80). Allocations to water rose from 3.5% to 6.5%, the largest increase in the economic infrastructure subsectors. Meanwhile, allocations to the productive sector fell from 47.9% to 38.9% for the corresponding periods. Deterioration in budgetary balances together with the increased uncertainties facing the productive sector, and particularly the export sector in the BMCs, had forced a deeper involvement in infrastructure development by the CDB.

The decade also witnessed an intensification in the Bank's strategic response to the issue of poverty. There was clearly some frustration that growth did not impact substantially on unemployment and hence lead to a reduction in poverty. Mr. William Demas, the second President of the CDB, in 1982 pointed out that, despite high rates of growth in the productive sector in the fifties and sixties based on foreign private capital, unemployment in the Region had increased.[18] There was now greater concern about the development of support for medium and small enterprises. In a very thought-provoking presentation on an economic development strategy for the Region, the President stated that the regional strategy should be more balanced, encompassing both large, capital intensive, foreign-owned enterprises and small to medium enterprises using more labour-intensive technologies so as to accelerate labour absorption. This latter dimension was referred to as one component of the basic needs approach to growth and development which included increased access by the poor to credit, TA, economic and social infrastructure to enhance opportunities for income generation and social welfare improvements.[19] Articulating this new approach to development, the Bank's lending to the productive sector through the DFCs rose from $32.6mn (1970-80) to $74mn (1981-90). In 1982, the Bank also established the Caribbean Technological Consultancy Services (CTCS) Network to provide TA to small and medium-sized enterprises. With the help of the donor community, the Bank expanded the BNTF programme with two additional tranches, one each in 1982 and 1984 totalling $49.4mn.

Additionally, the Bank entered a period of deepening concern with human resource development (HDR), an area that it had to a large extent eschewed in the first decade of operations as being the preserve of Governments and aid

---

16 *Ibid.*, p. 1 01.

17 *Ibid.*, p. 122.

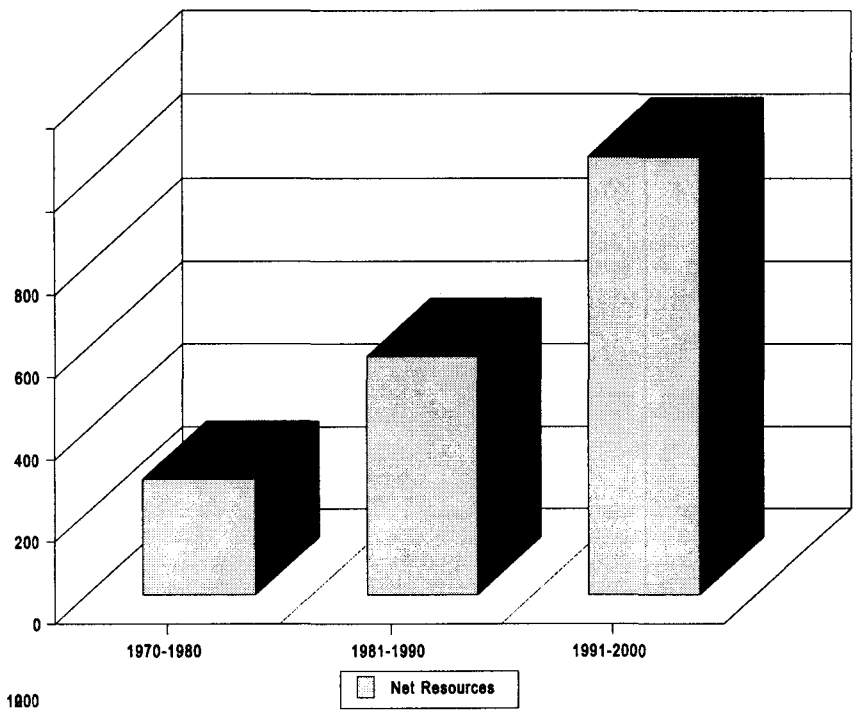
18 *Ibid.*, p. 61.

19 *Ibid.*, pps. 59, 60, 182.

donors. The Bank's management began to place greater emphasis on the development and efficient use of the skills base in the Region.[20] It was becoming increasingly clear that HRD was one of the keys to economic survival and poverty reduction as the Region entered the decade of the nineties with trade liberalisation and globalisation issues moving centre stage and the Bank's involvement in the education sector beginning to expand.[21] Lending for student loans through the DFCs rose from $2.9mn (1970-80) to $12.9mn (1981-90). Direct lending to the education sector increased from $12.9mn to $16.8mn. The proportion of the Bank's allocations to human resource development had increased even though that to the social sector had declined. Structural adjustment and a changing international environment were beginning to push to the fore concerns about international competitiveness.[22] Attention began to focus on both macro (exchange rate, commercial, investment, monetary and fiscal policies), and micro (technical, managerial, labour) efficiency and the Bank initiated expansion of its operations to include the deepening of HRD in the Region.

Figure 1: Net loans, Grants, Contingent Loans, Equity (1970--2000

($ mn)



20 *Ibid.*, p. 137.

21 *Ibid.*, p. 178.

22 *Ibid.*, pps. 96, 151, 191.

CDB in the Nineties

The nineties witnessed the intensification of trends that had begun to emerge in the previous decades. Earlier fears about the discontinuation of preferences proved well-founded as the European Union (EU) began the process of dismantling trading regimes that had protected major export commodities for decades. The reduced availability of aid from traditional donors as a result of their focus on Eastern Europe and Africa and also their own monetary and fiscal policy concerns were important developments, especially in Europe which was pursuing the establishment of a monetary union. The emergence of trade blocs (NAFTA, EU) was also a part on the new international economic landscape. The Caribbean found itself faced with reduced access to external concessional resources and with increased questions about its own competitiveness and ability to survive economically as preferences were dismantled.

The Bank responded by accelerating the flow of resources to the Region. Between 1991 and 2000, the Bank approved allocations of $1.0bn to its BMCs, 55.0% of all allocations for the 1970-2000 period. The Bank supported attempts to enhance efficiency in traditional areas of production (bananas and sugar) and to accelerate the process of economic diversification, based on the Region's comparative advantage. During the decade, with continued CDB support, the tourism sector strengthened and in some territories matured (together with the offshore finance sector), becoming the new engine of growth. Through the DFCs, the Bank funded the development of non-traditional agricultural exports which expanded significantly during the period. As part of the process of efficiency and output enhancement, some economies (Guyana, Grenada, and Antigua and Barbuda) in the nineties undertook, with CDB's assistance, structural adjustment programmes. In the case of Guyana, the Bank contributed financial resources ($42mn) as part of the support by the international financial institutions and community. In the other two cases, CDB's support was mainly in the form of technical assistance to formulate the necessary adjustment policies. The Bank also helped the BMCs to lay the groundwork for increased labour productivity by accelerating the pace of human resource development. Direct lending to education escalated from $16.8mn (1981-90) to $59.7mn (1991-2000). Allocations to student loans almost trebled, rising from $12.9mn (1981-90) to $34.6mn (1991-2000).

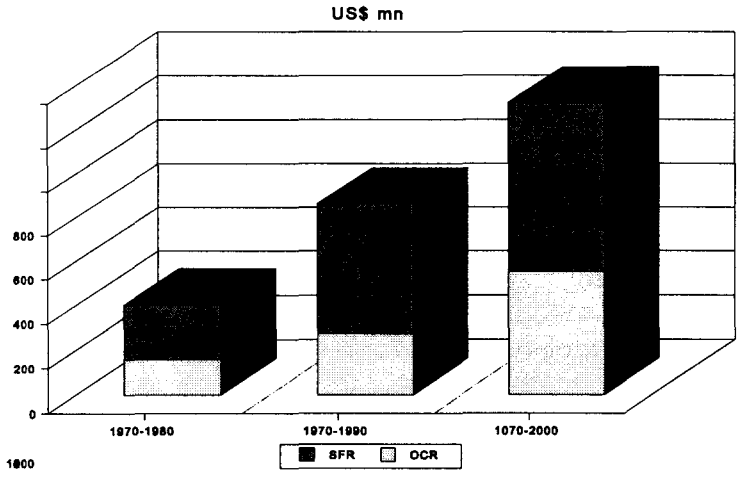
During the decade, there were two noticeable shifts in Bank policy. The most noticeable of these was the Bank's further involvement in the social sector. The Bank's Social Development Division was established in 1994 to bolster lending to the sector. Direct allocations to health, education (including those from a fourth tranche of the BNTF) and housing ballooned from $28.2mn ((1981-90) to $172.0mn (1991-2000). Allocations for housing and student loans through the DFCs and other intermediaries grew from $33.5mn (1981-90) to $72mn (1991-2000). Allocations to the social sector rose from 10.5% (1981-90) to 23.0% (1991-2000) of net loans, contingently recoverable loans, grants and equity. This reflected continuing fiscal problems in some countries that made social sector funding difficult and also recognition that despite real income growth, social sector

development was lagging behind in most countries.[23] Another important development was a deepened concern with the environmental impact of the Bank's lending, a reflection of the Bank's growing attention to the sustainability of the development process. Environmental impact assessments became a regular feature of project analyses. In all, the decade may be characterised as one in which the Bank matured into its responsibility as a channel of investment resources to the Region. It was also a decade of deepened environmental and social consciousness and action.

III. CDB AS FINANCIAL INTERMEDIARY

A major responsibility of CDB as a multilateral development bank is the mobilisation of investment capital from the international financial community and official development assistance agencies for on lending to its BMCs. International capital sourcing has a clear justification in terms of aggregate savings-investment gaps. Further justification resides in the superior terms and conditions of CDB's external borrowing as compared with those faced by individual BMCs in international financial markets. In addition to the benefits of superior loan size, the Bank with an asset portfolio consisting of credits to individual Caribbean countries, is a de facto country risk pooling entity, thereby minimising the sum of individual country risks and reducing the risk premium (Bourne 1996). Reduced market interest rates with long grace periods and maturities translate into significant cost savings to borrowing members. Moreover, CDB, by virtue of its superior knowledge of local conditions and influence on national economic policies, has become the preferred conduit of donor funds in many instances.

Figure 2: Capital Structure (1970-2000)



23 CDB, Statements by the President, 1990-9, pp. 7, 126.

The Bank's Resource Base

CDB's financial strength has grown considerably since its inception. Its capital base consists of members' subscriptions that are divided into paid-up and callable portions. At its inception, the Bank's ordinary capital resources were $50mn (10,000 shares) evenly divided between paid up and callable capital. Since then, the Bank has had three general capital increases and several special capital increases which were associated with the admission of new members. At the end of 2000, the Bank's subscribed capital amounted to 107,971 shares with a value of $705mn. Callable-shares represented 78.0% while paid-up share capital stood at 22.0%.

The Bank's Charter stipulates that not less than 60% of its total authorised share capital should be held by its regional members and not more than 40% by its non-regional members. This was used as the basis for the initial subscription of its regional and non-regional members. Despite these defining parameters regarding ownership structure, it is interesting to note that in terms of contributions to the Bank's resources, regional members are in the minority. As at December 31, 2000, the total resources available to the Bank for its ordinary and special operations amounted to $1,232.9mn. If one excludes from this total net income and reserves, the BMCs' total contribution is approximately 16%. As such, CDB's ability to continue providing resources will be largely contingent upon the continued support of non-borrowing members.

CDB's financial policies are designed to reduce risk within the broad parameters afforded by its minimum profitability requirements. The Bank's asset and liability management has been very risk-averse and is mirrored in its conservative borrowing and lending limits. In fact, prior to a private placement in 1992, CDB's borrowing had been limited to the World Bank and the Inter-American Development Bank (IDB).

The Bank's resources consist basically of hard and soft components. Hard funds which attract a higher rate of interest and shorter payback periods are represented by its Ordinary Capital Resources comprising Paid up Capital and Ordinary Reserves in addition to some commercial borrowings. Soft funds are captured under the Bank's Special Fund Resources and comprise both the Special Development Fund and the Other Special Funds Resources. Consistent with the principle of seeking to finance the development agenda of its borrowing member countries in the most cost effective manner, CDB has placed much emphasis on the acquisition of soft resources. In this spirit, over the decade to 1980, approximately 63%, ($245.2mn) of the Bank's loanable resources were soft. On a cumulative basis, this figure increased to 68% ($589.4mn) by the end of 1990 but thereafter declined by thirteen percentage points to 55% ($678.4mn) by 2000. This reduction in the soft component of CDB's resources broadly reflects two developments:

(i) a greater reliance on market borrowings during the early nineties primarily in response to greater loan demands by its BMCs; and

(ii) the prevailing mood of donors towards the granting of aid resources.

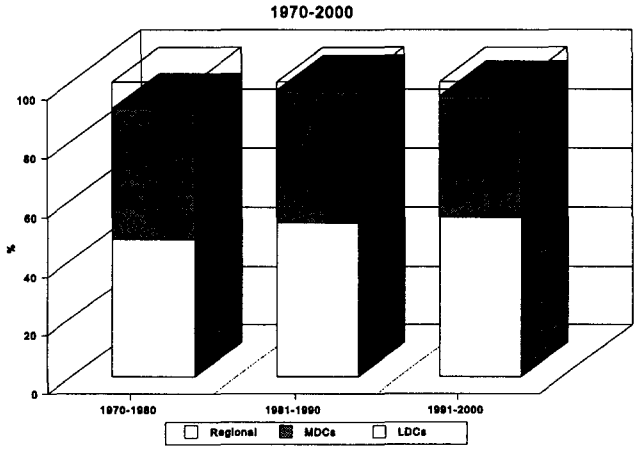
In terms of the CDB's lending patterns, there has been a deliberate bias in favour of the LDCs.[24] This distribution of funds is consistent with the Banks's mandate which requires the Bank to pay special attention to less developed countries in the Region. On a cumulative basis, LDCs have received a total of 52.7% ($1,015.6mn) of total loans, contingent loans, equity and grants during 1970-2000.

IV. SECTORAL ANALYSIS

The Productive Sector

As indicated earlier, the Bank, from its inception, paid particular attention to the development of the productive sector, focusing on agriculture, manufacturing and tourism and to a lesser extent on the mining sector which was largely foreign-owned. During 1970-2000, the Bank approved an estimated $649.7mn or 33.7% of net loans, contingent loans, grants and equity for the productive sector with an estimated $272.6mn or 42.0% going to agriculture, $276.9mn (42.6%) to manufacturing, $61.6mn (9.5%) to tourism and $38.6mn (5.9%) to mining.[25]

Figure 3: Distribution by Country Groups



Agriculture

The substantial involvement of the Bank in the agriculture sector was a natural outcome of the sector's importance in Caribbean economies in terms of

24 See Footnote 1.

25 CDB, *Annual Report 2000*, p. 120

its contribution to GDP, foreign exchange earnings and employment and growing concerns about its performance prior to and during the review period 1970-2000. Caribbean agriculture had been essentially geared towards preferential export markets, the main agricultural commodity exports being sugar, bananas and citrus. Export agriculture and Caribbean economies generally benefitted from protected markets despite production problems and sometimes volatile price fluctuations. However, the nineties saw a gradual diminution of preferences, forcing Caribbean agricultural exports to face increasing international competition and posing serious questions about sustainability. The changed marketing environment resulted in initiatives to stimulate productivity and to some diversification of agricultural exports and markets. However, export revenues from non-traditional exports generally still lagged substantially behind revenues from traditional exports. Similarly, agricultural production for domestic markets lagged substantially behind food demand, continuing to make the Region a significant net importer of food.

The unsatisfactory performance of the agriculture sector is the result of various constraints, including a skewed distribution of land resources and insecurity of land tenure, high land prices, limited extension services, poor soil fertility, undercapitalisation, high input costs, restricted access to credit, poor marketing, insufficient infrastructure (feeder roads, drainage and irrigation), low skills, limited availability of labour and poor agricultural technology. The difficulties in the sector are sometimes compounded by poor macroeconomic policy such as overvalued exchange rates making imports cheaper and more competitive and price controls which have reduced the profitability of certain products. As in the 1960s, the challenge remains of transforming the agriculture sector, making it more competitive.

CDB's Interventions in the Agricultural Sector

The Bank's approach to agriculture has been to lend directly to private enterprises or Governments or indirectly through the DFCs and other financial intermediaries. In its direct lending the Bank has placed substantial emphasis on lending for crop production. Approximately 43.0% of direct lending has been in support of crop farming, essentially in the export sector to enhance foreign exchange earnings. In the export sector, the Bank has funded land development, production of planting material, crop replanting, crop establishment, pest and disease control, harvesting and factory refurbishment. In further support to export agriculture, in this case, particularly the banana industry in the Windwards, the Bank has placed substantial emphasis on feeder road development. Approximately 33.0% of direct lending to the agriculture sector has been for the development of feeder roads to facilitate the transport of inputs into and output out of the farming regions and to enhance fruit quality. The Bank's involvement in other infrastructure development such as drainage and irrigation has been much less, in part possibly because of the involvement of other donors and also because of the high cost and consequent low demand from the BMCs for this type of infrastructure. The Bank has also been very much involved in financing, especially post-hurricane rehabilitation efforts in banana agriculture in an attempt

to expedite a return to normalcy. It is estimated that close to 80.0% of direct lending by the Bank has been in support of export agriculture in the Region.

Other direct lending for production purposes has encompassed essentially horticulture and livestock production (beef, sheep), the former in particular for export markets and the latter intended both for the domestic and possibly regional markets. Additional areas of direct lending to the agriculture sector have included land settlement and rural development, fishing and forestry. Lending for these activities, however, accounted for less than 10.0% of CDB's direct allocations to the agriculture sector. Lending for land settlement and rural development has generally been in support of land redistribution, especially in the Windwards and Leewards. The objective has been the expansion of the production base and enhanced productivity, with production targeted mainly for the domestic market but also for export markets where possible. The Bank's direct involvement in the fisheries and forestry sectors has been minuscule (only one forestry project in Trinidad and Tobago and two fisheries projects, one each in the British Virgin Islands and Antigua and Barbuda) in part because of high risk and also the substantial involvement of other donors in these sectors.

As indicated above, particular emphasis has been placed on export agriculture, given its importance to regional economies. However, as a result of concerns about the Region's growing reliance on food imports, the Bank has also attempted to fund production for domestic markets. This objective has been pursued essentially through the DFCs. Import substitution initiatives have also been pursued at the Regional level in the agriculture sector, though, as noted above, without much success. The DFCs have been used to improve access to agricultural credit especially to small farmers, an important development in the financial sector which has traditionally shied away from small-farm agriculture. In addition to increasing the supply of food to domestic markets, lending to the small farmer has helped the Bank to achieve one of its most important objectives which is an improvement in farm incomes and a reduction in rural unemployment and poverty. The DFCs have also been a source of funding for the development of non-traditional export agriculture which has been expanding in recent years, especially in response to difficulties in the traditional export sector. Hence, while it is difficult to estimate with certainty the size of the Bank's allocation to export agriculture, it is certain that any estimate based solely on the Bank's direct lending to the sector is essentially biased downwards.

While the Bank has clearly supported the expansion of the Region's agriculture, the sector's continuing lack of competitiveness forces the question as to whether enough attention has been paid to productivity enhancing measures such as the development of the right policy framework (pricing, land market, labour market policies etc.), institutional development (establishment of farmer organisations to facilitate dissemination of knowledge, marketing infrastructure development), support for training in agronomy and improved farm management, technological enhancements (tissue culture, new varieties, introduction of capital equipment etc.) and productivity enhancing infrastructure (drainage and irrigation). The task of transforming the agriculture sector remains a major challenge for the Region and for the Bank.

Manufacturing

The manufacturing sector in the Region can be broken down into three major categories:

(a) heavy industry concentrated in the larger territories - Trinidad and Tobago (petroleum, petrochemicals, steel etc.), Jamaica (alumina); Guyana (gold, bauxite);

(b) light industry, including agro-industry, producing for the domestic and regional markets or preferential extra-regional markets (rice, sugar); and

(c) assembly-type industries (garment, electronics) targeting mainly the US market.

The first category is generally highly capital-intensive, geared mainly towards extraregional markets and with access to external financing. The second industrial category, especially in the case of industries not serving preferential markets, has operated essentially behind protective barriers (tariffs, quotas) and generally has not matured into extraregional exporting because of inefficiencies related to scale diseconomies, the disincentives towards enhanced efficiency provided by a sustained protective regime, input constraints such as a limited availability of skilled labour and poor raw material base. The third category of industry is mainly low wage, high employment, enclave industries producing for the US market.

CDB's Interventions in Manufacturing

CDB has essentially focused its interventions on the second and third categories of the manufacturing sector discussed above. The objectives of the Bank's interventions in the manufacturing sector have been employment creation, foreign exchange generation/savings and the development of domestic and regional entrepreneurship. To foster industrial development and also promote inter- and intra-industry linkages in its BMCs, the Bank has placed high priority on agro-processing for domestic and export markets. Approximately 25.0% of the resources allocated to manufacturing has been for agroprocessing (excluding sugar) - rice milling; meat processing and packing (Belize and St. Vincent and the Grenadines); milk and arrowroot processing; and cocoa fermentation (Grenada).

Sugar, with approximately 14% of the allocations, has been the Bank's other major area of involvement in agro-processing. In the decade of the seventies, most of this effort was focused on Antigua and Barbuda and St. Vincent and the Grenadines where unsuccessful attempts were made to re-establish the industry. Loans were provided for the establishment of factories and, in the case of St. Vincent and the Grenadines, also for the rehabilitation of cane fields. The Bank's efforts in sugar in the following two decades were concentrated on Barbados with funds allocated for the establishment (Portvale sugar factory), rehabilitation and upgrade of sugar factories. Other direct allocations to light manufacturing

have been scattered over a range of products - textiles, shoes, paper, wood, chemical and non-metallic mineral products. Funds going to these industries together account for less than 10% of the allocations to manufacturing but have been part of the Bank's strategy of fostering the development particularly of medium-sized enterprises.

While in general not lending directly to assembly-type industries, the Bank supported their development through the provision of funds for physical infrastructure development. The largest direct allocation of resources to the manufacturing sector, approximately one third, has been for the establishment of industrial estates, mainly in the OECS Region. The objective has been to provide ample infrastructure necessary for the establishment of light manufacturing, intending thereby to generate foreign exchange and also help alleviate the unemployment problems that have continued to plague many of CDB's BMCs.

As in the case of agriculture, the DFCs have played and are continuing to play an important role in the development of light manufacture through the provision of access to credit, particularly for small industrial enterprises, complementing the Bank's efforts in the provision of infrastructure. It is estimated that close to 25% of the Bank's allocations to manufacturing have been through the DFCs. In fact, the data show an interesting change in the Bank's strategy over the three decades with lending through the DFCs assuming increasingly greater importance, rising from approximately 10% of total allocations to manufacturing in the seventies to close to 40% in the nineties.

An important CDB contribution to the development of the Region's manufacturing sector, especially small and medium-sized enterprises, has been the provision of technical support to enhance efficiency, formulate promotion and marketing strategies, devise financial and operational restructuring strategies and generally provide, on a short-term basis, skills in areas of need. This has been done through the CTCS Network established since 1982 and which has used its access to domestic, regional and extraregional skills to address skills bottlenecks in the manufacturing sector. During 1982 to 2,000, it is estimated that the Network responded to more than 3,000 requests in CDB's 17 BMCs and close to 5,000 persons were trained.

Despite all of the foregoing efforts, indications are that the current decade will witness in many BMCs a miniaturisation of the manufacturing sector because of the inability to compete internationally. This gives rise to at least two important questions:

(a) which industries currently have the best chance of survival and therefore should receive support; and

(b) in addition to more enlightened national macroeconomic and industrial policies supportive of the development of efficient enterprises, should there not be a refocusing of the Region's industrialisation strategy, based on exploiting regional production complementarities so as to reduce scale diseconomies?

Tourism

Despite constraints of air access and limited promotion in some cases, tourism has been one of the fastest growing areas of economic activity in the Region, providing foreign exchange and expanded employment opportunities. Tourist arrivals almost quintupled between 1970 and 1999.[26] Quite unlike other export endeavours in the Region, this has been achieved outside of the context of preferential market arrangements, underlining the Region's international competitiveness and buoying hopes of sustainability. However, in the current economic environment, the Region recognises the need to enhance its competitiveness in order to ensure sustainability. The rapid growth of tourist arrivals has made the development of accommodation a priority for the Region. While cruiseship arrivals have exhibited quite robust growth within the last decade, expenditure by this tourist category accounts only for approximately 10% of tourist expenditure in the Region.[27]

CDB's Interventions in Tourism

In an effort to strengthen the Region's tourism industry, CDB has provided resources for the expansion of tourist (hotels, cruiseship piers, tourism shopping complexes, tourist sites) and related facilities (airport, roads, water and sewerage infrastructure development). The allocation of resources to the tourism sector, while not as large as that to agriculture and manufacturing, has not been insignificant. Direct lending to tourism totalled $61.6 mn during 1970-2000. Reflecting the scarcity or limited access to domestic resources in its BMCs, the Bank's most dominant area of involvement has been in construction, expansion and rehabilitation of hotels of all sizes - small, medium and large- but with focus on small and medium enterprises in an attempt to stimulate domestic entrepreneurship.[28] Close to 60% of the Bank's direct lending to the tourism industry has been focused on the expansion of accommodation capacity. The Bank's lending for hotel development has been to both the public and private sectors and has spanned both the MDCs (Barbados, Trinidad and Tobago) and LDCs (St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Grenada), including the dependencies (Anguilla, Cayman Islands, Turks and Caicos Islands). Most of the lending for this purpose has taken place in the last two decades with the surge in tourist activity in the Region.

---

26 Caribbean Tourism Organisation, Caribbean Tourism Statistical Report, 1999-2000, p.21.

27 *Ibid.*, pp. 32, 95.

28 It should be pointed out that CDB's policies limited its involvement in tourism sector financing. For example, lending to any single private sector tourism project was limited to 15% of the Bank's ordinary reserves, and equity involvement was limited to $50,000.

Another important area of the Bank's involvement has been physical infrastructure development. In addition to airport development which has impacted on tourism expansion, especially the stay-over segment, and which is discussed below, the Bank has also financed the development/rehabilitation of cruiseship piers as, for example, in Jamaica and St. Lucia. Other CDB involvement in the tourism industry includes the development of eco-tourism sites and ancillary investment (parking, viewing platforms etc.) as in Dominica and heritage projects as in the Cayman Islands. The Bank has also lent indirectly to the industry through the DFCs for small hotel construction, expansion or rehabilitation and for ancillary developments in transportation (taxis, boats) and in the restaurant industry.

After having experienced very rapid growth in tourism, there is now a growing unease about the Region's ability to maintain its competitive position. This suggests the need for CDB and other donors to refocus their involvement towards more efficiency-enhancing measures such as product quality, monitoring of industry standards and environmental enhancement issues (cleanliness, beautification).

Mining

The mining industry until recently has not figured prominently in CDB's operations, a reflection of the capital-intensive and predominantly foreign-owned character of much of the sector. The industry accounts for less than 10% of allocations to the productive sector and approximately 2.0% of CDB's allocations for the period 1970 to 2000. Close to 90% of those allocations have been to two projects in the oil sector in Trinidad and Tobago for the expansion of oil and gas production - the Onshore Secondary Oil Recovery Project approved in 1992 ($11.8 mn) and the project for the Expansion of the National Gas Company ($21.5mn) approved in 1996. In the case of both projects, CDB collaborated with other institutions to provide financing. The financing of both projects is consistent with CDB's objective of helping to expand output in the Region with particular emphasis on those sectors earning foreign exchange. A project of similar character financed by the CDB was the expansion of the aluminium plant in Jamaica (JAMALCO Plant Expansion) in 1993. The majority of the other projects funded in the mining sector have been in support of quarry development to augment product supply to the domestic market. These projects have been located in St. Vincentand the Grenadines, Grenada and the Cayman Islands.

Economic Infrastructure

The Bank has placed significant importance on the development of economic infrastructure (physical infrastructure and public utilities) to support economic growth and development in BMCs. During 1970-2000, the Bank approved $604.5mn or 31.4% of net loans, contingency loans and equity for economic infrastructure with an estimated $438.9mn (72.6%) for physical infrastructure (roads, seaports, sea defence and airports) and $165.6mn (27.4%) for public utilities (power and energy, water and telecommunication).

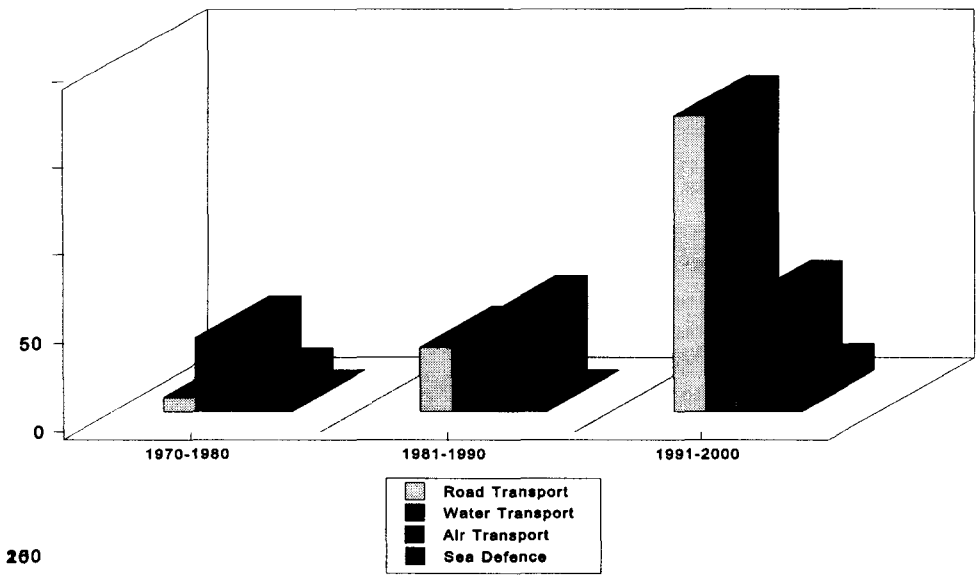
Physical Infrastructure

Many BMCs during the review period have had relatively low levels of infrastructural development. The inadequacy of physical infrastructure (roads, bridges, sea and air transport) limited their potential for growth. The dispersal of CDB's BMCs over a wide geographic area also made it critically important for the countries to have reliable transportation links with each other and with the rest of the world. In addition, natural disasters (mainly hurricanes) have caused frequent damage to physical infrastructure, and countries have had to incur enormous costs of repair and rehabilitation. Many BMCs have also faced difficulties because of poor maintenance, low and, in some instances, deteriorating operating efficiency, uneconomic pricing, weak investment project management and lack of counterpart funding.

CDB's Interventions in Physical Infrastructure

During 1970 to 2000, the Bank approved an estimated $438.9mn or 22.8% of net loans, contingency loans, grants and equity for physical infrastructure development with $212.5mn or 48.4% for road transport; $84.4mn or 19.2% for water transport; $14.9mn or 3.4% for sea defence in particular and $127.3mn or 29% for air transport. The Bank supported the development of physical infrastructure to stimulate private sector investment, economic growth and development.

Figure 4: LENDING FOR PHYSICAL INFRASTRUCTURE (1970-2000)
($ mn)



Road Transport

Funding for the rehabilitation and reconstruction of the main roadways was geared to enlarge the road network so as to improve essential links with seaports and airports. In the seventies and early eighties, the development of road transport was focused on supporting the agriculture sector. Most of the coastal roads provided the only link between populated areas and between feeder roads and ports through which agricultural exports were shipped. The poor condition of some of these main roads contributed to high vehicle operating costs and a reduction of foreign exchange earnings because of damage to agricultural exports during transport to the port of shipment. However, with a changed focus on tourism development to support economic diversification from the mid-1980s, there was also the need for a proper road network system to facilitate speedy movement of tourists.

From 1970 to 1980, $8mn was approved for road transport, representing 3.8% of total resources approved for the entire sub-sector. The approvals increased significantly to $36.1mn during 1981-90, and to $168.4mn during 1991 to 2000, representing 17% and 79.3 % of resources going to the sub-sector respectively. The major beneficiaries of the road transport programme were Barbados, Belize, Trinidad and Tobago, Jamaica, St. Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines.

Despite significant loan approvals for improving the road network in many countries, poor roadways persist because of inadequate maintenance. The stress imposed by the use of heavy vehicles together with the absence of systematic maintenance programmes has accelerated the deterioration of main roads to the point where reconstruction in many cases has been the only option. CDB has encouraged increased budget allocations for road repairs, the establishment of maintenance units and preparation of maintenance manuals. CDB also recognises that urban transportation in a number of BMCs is becoming problematic because of congestion, and has urged formulation of road development strategies.

Water Transport

CDB's lending for water transport (deep water ports, wharf expansion) was most dominant in the early seventies. Significant lending during this period was focused on port/wharf development in several member countries, particularly LDCs, to promote international trade. Improved deep water ports and cargo facilities were built in Anguilla, Belize, Cayman Islands, Grenada, the Commonwealth of Dominica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines and Montserrat. The primary objective of improving the deep water ports was to expand docking capacity and to enhance the efficiency of cargo-handling, taking into account the changing technology in freight transport and the need for expansion especially in LDCs. During this period, CDB was involved in financing WISCO to improve inter-regional shipping in support of regional economic integration. The emphasis shifted from agricultural-based facilities to more tourism-based facilities beginning in the mid-eighties and continued in the nineties as tourism became the dominant industry in many economies. The

improvement and upgrading of cruiseship piers and berthing facilities and related onshore facilities (reception building, parking areas, etc.) were necessary to accommodate increased cruiseship arrivals.

During 1970 to 2000, $84.4mn was approved for water transport. During 1970 to 1980, $49.2mn (38.2%) was approved for water transportation and $32.2mn (38.2%) and $10.7mn (12.7%) for 1981-1990 and 1991-2000 respectively. The allocation for sea defences was $14.9mn for the period 1970-2000, 3.2% of total resource approvals for physical infrastructure. The beneficiary countries were Guyana and Dominica.

Air Transport

CDB's lending to this sub-sector in the early seventies was to LIAT under the guarantee of regional governments; to the Turks and Caicos Islands for the purchase of aircraft and spares and to St. Lucia and Antigua for the construction of an air cargo terminal to strengthen intra-regional travel and trade. The overarching objective during this period was strengthening regional integration within the Caribbean through the development of transport links. The growing importance of tourism in the eighties and nineties also led to rising levels of resource approvals for upgrading airport facilities in many BMCs. In many instances, passenger terminal buildings had to be expanded and upgraded to improve passenger and cargo handling to ease congestion. In addition, airport runways had to be lengthened to accommodate larger aircraft. The major beneficiaries of resources for air transport development were Barbados, the Bahamas, Belize, Cayman Islands, St. Lucia, St. Vincent and the Grenadines and the Turks and Caicos Islands. For the period 1970-2000, net loans, contingent loans and grants approved for air transport amounted to $127.3mn. For the sub-periods, 1970-80, 1981-90 and 1991-2000, $12.3mn (9.7%), $53.1mn (38.2%) and $61.8mn (48.6%) respectively were approved.

CDB identified several institutional (lack of technical skills, poor management, weak accounting practices) and policy (mainly pricing) weaknesses that influenced negatively the financial viability of enterprises engaged in the management of economic infrastructure. The Bank recognised that the financial viability of these entities was of crucial importance and that they should not be a drain on government finances. In addition to the provision of technical assistance for institutional strengthening, CDB insisted on organisational, operational and policy reforms including the establishment of appropriate accounting systems and that tariffs and charges be set to cover operating costs, debt servicing, satisfactory returns on equity and contribution to expansion. In cases where there were generally no tariffs or user fees, such as road transportation, CDB encouraged that special allocations in the recurrent budget be used solely for road maintenance. The Bank recognised that efficient management of infrastructure development was critical to enhanced fiscal performance and international competitiveness.

Power, Water and Communications

CDB has financed the development of utilities as an important strategic component of economic infrastructure expansion in support of economic growth and development. A major objective of CDB's intervention in this sector has been assisting its BMCs in satisfying increasing demand for water, electricity and communications services. However, in financing expansion, CDB adopted a holistic approach, taking cognizance of issues which would have implications for the efficient operations of the utilities. One of these issues related to utility pricing. Utility tariffs are the source of much contention because of the status of water and electricity as basic necessities. In the Region, where per capita incomes are relatively low, there is often strong conflict between setting tariffs at levels which would guarantee financial viability and containing the cost of living. CDB's polices recognized that tariffs should cover operational costs, debt servicing, appropriate returns on equity capital and contributions to system expansion. There was also the recognition that tariff structures should take cognizance of the long-term marginal cost of satisfying demand since this has implications for the efficiency of resource allocation.

Another major concern in CDB's approach has been distribution. Many countries have been plagued by high distribution losses, which meant that more resources were being dedicated to satisfying a given level of consumption than was necessary. There was also the issue of the organization of the industries. Most of the utilities in the Region are monopoly suppliers, and hence the regulatory framework is a key component of the organisation of these industries, having profound implications for allocative efficiency and social welfare. CDB's lending policies recognized the importance of the regulatory framework to efficient functioning of the industries. Additionally, efficiency is influenced by the level of autonomy and the implementation of sound management systems, with respect to information flows, human resource use, accounting and auditing, and environmental issues. These considerations were also factored into CDB's interventions.

CDB's Interventions in Power, Water and Communications

During 1970 to 2000, net loans, contingent loans, equity and grants approved for power and energy amounted to $70.5 mn, while approvals for water amounted to $86.3 mn. This represented 3.7% and 4.5%, respectively, of net total loans, contingent loans, equity and grants approved during the period. Communications received $8.8 mn, or 0.5% of total approvals. In terms of the number of projects, electricity and power and water supply accounted for 102 (5.4%) and 50 (2.6%), respectively, of the total number of CDB projects, while communications accounted for 0.4%.

From 1970 to 1980, the Bank allocated $10.3mn to power representing 3.6% of resource allocation for that period. The resources going to this sector increased to $24.2mn during 1981 to 1990, but more importantly, the percentage of total resources approved climbed to 4.2%. There was a further increase in nominal terms in 1991-2000 to $35.9mn, but in percentage terms, there was a decline to 3.4% of total resource allocation. The trend was also reflected in the number of

projects, which rose from 28 in 1970-80 to 65 in 1981-90, falling to 9 in 1991-2000.

There were a number of reasons for these trends. As the economies grew, so did the size of the power companies and the amount of financing that they needed. At the same time, the incidence of privatisation in this sector increased. CDB's policy with regard to the private sector limited lending to any single entity to $7mn, which was substantially below the needs of power companies, especially in the larger BMCs. Furthermore, CDB started to face competition from alternative sources of finance. Investment by power companies was increasingly financed by issuing bonds, accessing loans from larger financial institutions, and entering into abuild, operate, transfer arrangements.

Resources flowing into water supply increased from $9.8mn in 1971-80 to $38.0mn in 1981-90, and remained stable at $38.5 mn in 1991-2000. As a percentage of total resources, this represented a rise from 3.5% in 1970-80 to 6.5% in 1981-90, followed by a decline to 3.6% in 1991-2000. The number of approvals climbed from 12 in 1970-80 to 18 in 1981-90, then fell marginally to 18 in 1991-2000. Most of the lending activity was concentrated in Belize and the OECS countries, as the financing needs of the larger BMCs were beyond CDB's lending limit. The fall in the percentage of total resources going to water supply reflected a deterioration in the performance of such utilities.

Resources going to communications were substantially smaller than those to power and energy and water. During 1970-2000, there were seven projects financed in this category. One of these was a capital project, for which a loan of $8.3mn was extended in 1982. The other projects were technical assistance interventions, all of which occurred between 1988 and 1997. The financing was mainly for institutional strengthening in preparation for liberalisation of the global information and communications industry.

Impact of CDB's Interventions

In several BMCs, CDB's resources facilitated the expansion in the supply of power and energy and water. This expansion contributed to the raising of incomes and of the standard of living. Development of utilities contributed to the stimulation of economic growth. Increased access to potable water, electricity and information and communications facilities supported the raising of living standards.

Consistent with its policies, CDB's contribution to financing the development of utilities has been broader than that of a typical financial institution because of its development focus. Along with an examination of the financial aspects of performance, CDB has also focused on effecting improvements in the operating standards of the utilities. This has been achieved through the extensive use of technical expertise and insistence on regional and international best practices.

All of CDB's interventions have involved a holistic approach to project financing. For example, in a loan for a typical power project, resources have been used to finance the acquisition of generating capacity; the construction of a station; the upgrade of the distribution system; environmental cleanup; institutional strengthening in the form of management system improvement, staff training and the retention of an environmental consultant; and project management. However, the appraisal process also focused on the adequacy of tariff levels,

regulation, and the extent of technical and non-technical losses. As such, CDB's interventions have been critical in bringing about an improvement in the operations of power utilities. CDB has been particularly influential in reducing distribution losses in electricity.

Social Sector Development

The social sector comprises education, housing and health. In total, the sector received $352.6 mn or 18.3% of the allocations for the 1970-2000 period. The direct and indirect allocations to the sector totaled $47 mn (1970-80), $61.6 mn (1981-90) and $244 mn(1991-2000) for the three sub-periods, indicating that there has been a significant escalation in social sector funding in the last decade. Funds earmarked for the social sector rose from 16.5% of total allocations in the first decade, declined to 10.5% but reached 23% in the nineties as the Bank moved more aggressively to fund social sector development.

Human Resource Development

Historically, limited and inequitable access, unsatisfactory education quality and inefficient management in general have plagued the education sector in the Region, compromising the pace of human resource development. While some attention has been given, particularly during the nineties, to expanding physical infrastructure to address the issue of access, inadequate emphasis has been placed on curriculum reform and development. In fact, an analysis of the subject areas being pursued raises questions as to whether a sufficiently large number of students are acquiring competencies in areas which would enable them to function effectively in the global environment.

CDB's Interventions in Human Resource Development

The Bank's policy position has always been informed by the need to maximise the sector's contribution to social and economic development. In rationalising its intervention, the Bank has been particularly cognizant of the need for the adoption of appropriate curricula and teaching methodologies to meet varying capacities, economic and social requirements. On the institutional side, the Bank has also sought to strengthen the Ministries of Education and training agencies in an effort to identify, prepare and implement appropriate educational programmes and projects and to improve information systems for policy formulation. The Bank has also sought to assist regional institutions including the Caribbean Examination Council and the University of the West Indies to provide support to education and training systems.

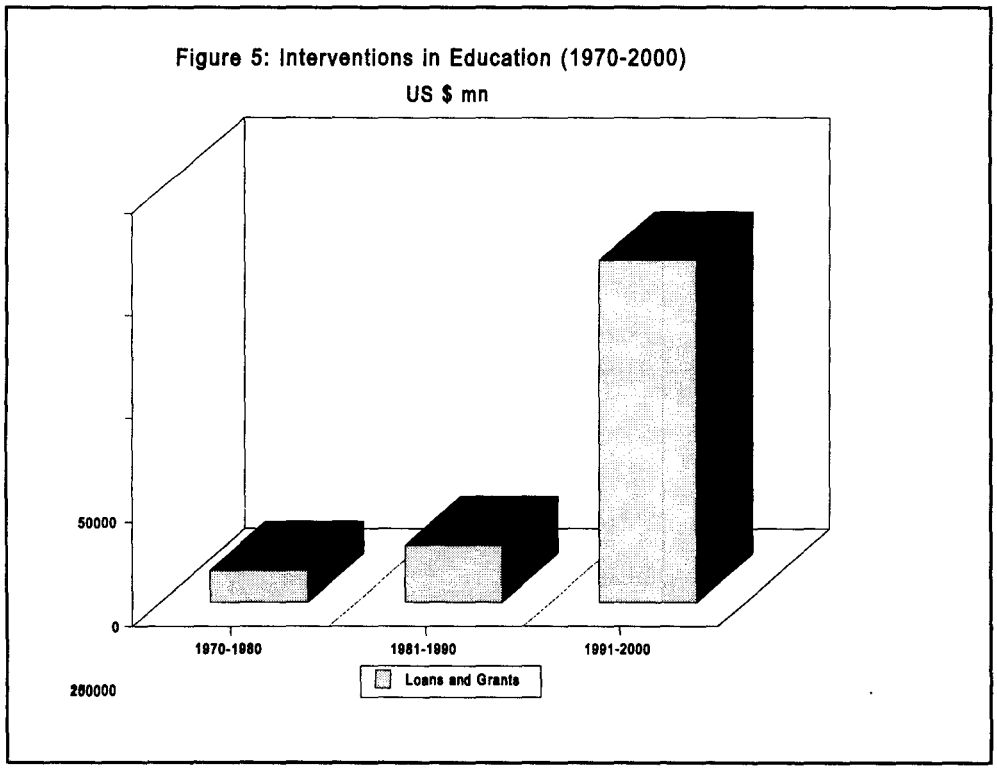
In terms of its funding programme, the Bank has allocated a substantial amount of its resources to fund interventions in the education sector. Over the 30-year period to 2000, a total of $207.7 mn comprising net loans, contingent loans, equity and grants has been approved for the sector. Indeed, this amount represented the second largest allocation in the social sector.

If one separates the review period into three distinct sub periods, some interesting observations can be gleaned. Figure 5 shows quite clearly the shift in the Bank's strategic direction which emphasised the growing importance of HRD as critical to addressing the challenges posed by globalisation. In the first decade of operations, the Bank advanced a total of $15.8mn to the education sector. However, in the two decades following, this allocation increased more than tenfold. Between 1981 and 1990 the allocation increased by 88% to reach $29.7mn and soared to $162.1mn by the year 2000. CDB's funds have been targeted almost evenly towards addressing issues relating to access, quality and effectiveness. In this regard, common features of most basic education projects have included a teacher training component, curriculum development, improvements to physical facilities, increased provision of equipment and education materials and capacity enhancement to monitor performance and school effectiveness.

Teacher Capability

Enhancing teacher capability is considered an essential component of initiatives to improve the quality of teaching and student learning. The vast majority of CDB's BMCs are short of a fully trained stock of teachers at the primary and secondary levels of the education system. As a consequence, professional upgrading of teachers or teacher designates has featured prominently in CDB-funded education projects since 1993.

Figure 5: Interventions in Education (1970-2000)



Curriculum Development

Curriculum development is another vital area in strengthening basic education at the primary and lower secondary levels of most countries in the Commonwealth Caribbean. In a number of cases, the curriculum being followed has not been reviewed or revised in the recent past. CDB's support for curriculum development has included advanced training for curriculum officers, strengthening curriculum development processes and assisting in the production, evaluation and distribution of teaching materials.

Education Management

A number of CDB-funded education projects have supported efforts to improve systems of data collection and management, as well as the monitoring and evaluation of education interventions. Assistance has included the conduct of management audits within Ministries of Education, preparation of medium to long-term education plans, training of education planners, data managers and testing and measurement personnel. The objective is to improve capacity and the practice of monitoring and evaluating impacts of education reform.

CDB recognises that regional economies need to be restructured and repositioned in the global market place. New institutional arrangements to build capacity and support a more diversified export-driven, competitive economy are imperative. Equally important is the need for a highly educated, creative, skilled and flexible labour force to address new demands. CDB intends, therefore, to continue its strong support to Caribbean member states in the continuous assessment of their education systems relative to the requirements of the knowledge-based global economy, quickly instituting the necessary reforms.

Housing

There have been several problems and constraints in the housing sector in many of CDB's BMCs. Severe housing conditions exist in many countries in the Region due to the deterioration of the housing stock and significant overcrowding. The lack of adequate levels of soft financing continues to be a stumbling block to satisfying the housing needs of the majority of low income households. Access to mortgage finance by low income households is severely restricted, given the rates of interest charged, the relatively short amortisation period, the collateral and equity required and the employment status of the heads of households. The provision of adequate housing at affordable cost, particularly to the lowest income earners, as well as upgrading squatter schemes to habitable communities present the greatest challenges to the authorities. Another major constraint to housing development relates to the unavailability of serviced plots for housing. In many countries, the cost of providing supporting infrastructural services and related maintenance is expensive, given the steep terrain, and funds allocated by governments for housing are limited. Also, the acquisition of new lands for residential purposes can be quite costly. The lack of government agencies capable of executing appropriate housing programmes is an additional significant constraint to the improvement of housing in the Region.

CDB's Policy in the Housing Sector

CDB has recognised the importance of housing as an integral part of social and economic development. The objective of CDB in the housing sector has been to provide financing to expand the housing stock, to make housing as affordable as possible and to provide improved access to housing finance. Lending to the housing sector has been aimed at improving the living conditions particularly of low income earners and providing greater access to services (water, electricity, roads, community services, etc.) with the objective of achieving:

(i) poverty reduction;

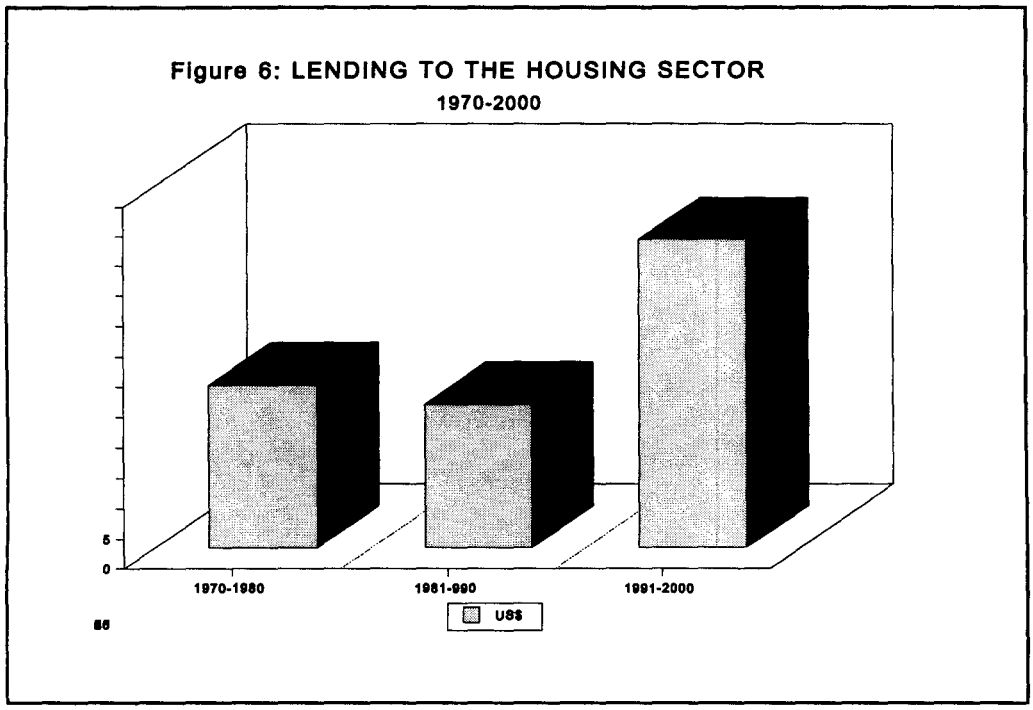
(ii) increased worker productivity;

(iii) increased domestic savings; and

(iv) promotion of inter-sector linkages within the economy so as to increase output and employment.

CDB's Lending for Housing Development

An analysis of CDB's portfolio at December 31, 2000 shows that $101.3mn (5.3%) of net loans, contingent loans, equity and grants have been approved for projects in the housing sector of which direct lending was $26.9mn and indirect lending (mortgage finance through DFCs) $74.4mn. CDB's lending in the housing



sector over the period 1970-2000 can be categorised into three distinct sub-periods covering four broad programmes:

(a) an Urban Working Class Housing (UWCH) Programme in seven LDCs (Antigua, Belize, Dominica, Grenada, St. Kitts/Nevis, St. Vincent and the Grenadines and Montserrat);

(b) a Secondary Mortgage Market programme in the LDCs, Barbados and Jamaica;

(c) loans to financial intermediaries for the granting of mortgage loans; and

(d) a Shelter Development Programme.

These programmes attempted to provide funds to the lower and lower middle-income groups in the various member countries where effective demand for housing was greatest and immediately serviceable.

During 1970-80, the focus was on the construction of new housing for low-income workers in urban areas in the LDCs (the UWCH Programme) and development of the secondary mortgage market programme. The UWCH programme was relatively successful with nearly 1,200 mainly two-bedroom houses being built between 1973-78. One fundamental problem affecting the implementation of the programme was the lack of effective institutions in the participating countries to implement and manage the projects. Consequently, many projects were plagued with significant delays which led to increased costs. Implementation of the programme was also affected by the unprecedented high inflation rates, particularly between 1974 and 1977, and the limited capacity of indigenous builders to undertake large projects. The secondary market programme sought to provide funds to meet the demand for housing in the lower and lower middle income brackets, and aimed at assisting the development of local financial intermediaries. Under this programme, CDB did not provide funds directly for the construction of units but rather acquired eligible mortgages from approved financial institutions, conditional on the agreement of the institutions to ensure servicing of the mortgages on CDB's behalf and also the reinvestment of securitisation proceeds in mortgages of similar type. The performance of this programme was rather disappointing as many governments did not provide the required foreign exchange guarantee. Another major difficulty which CDB faced in its attempt to establish a viable secondary market was the low level of development of primary mortgage markets, especially in the LDCs.

The period 1981 to 1990 witnessed a shift in focus in light of the experiences in the 1970s. CDB emphasised more the availability of mortgage finance through financial intermediaries directly to specified target groups rather than the funding of housing construction by Governments as in the 1970s. CDB lent to financial institutions (DFCs, mortgage finance banks, commercial banks) with the intention of increasing the pool of funds available for the provision of medium and long-term financing for the housing sector. The loans to financial intermediaries were made for financing housing construction and rehabilitation. Sub-loans

were made for the construction of new low-cost houses and the improvement of existing houses. The house improvement loans were to ensure that the life of the existing housing stock was extended as long as possible and that the amounts borrowed were in keeping with the amounts affordable by beneficiaries. This programme for home improvement was in recognition of the fact that over 60% of the housing stock in the Region was over 20 years old, and occupied by low-income earners who could not afford new houses.[29] CDB was relatively successful through its mortgage financing in improving the lending conditions for mortgage financing in BMCs. However, the low income earners to whom the mortgages were to be directed were not always the major beneficiaries of these funds.

The period 1991 to 2000 witnessed an upsurge in lending to the housing sector through the shelter development programme. The shelter development programme was supplemented with financing from the BNTF aimed at improving housing conditions of low-income households, mainly in deprived communities. The main challenges to the comprehensive development of shelter continue to be the unavailability and lack of access to services and to appropriate financing in light of increasing costs of traditional houses. The programme incorporated a shelter infrastructure revolving fund to finance infrastructural works as well as a special mortgage programme targeted at low-income households. The shelter development programme has been relatively successful in that many new houses have been built for the lowest income households and ongoing efforts are being made to upgrade squatter schemes in the most depressed areas.

Health

As indicated in the discussion in Section I, the social sector in CDB's BMCs was in the sixties generally weak. Health conditions in particular were poor as shown by the indicators on child mortality. This, of course, reflected not only the conditions of poverty and the level of medical care, but also the state of public health management. The infrastructure, both physical and institutional, particularly for water and sewage management was generally weak because of underfunding and the limited availability of skills to manage centralised systems.

CDB's Interventions in the Health Sector

Recognising these constraints, CDB in its interventions in the health sector, which were focused essentially on public health as reflected in the large number of sanitation projects, attempted to ensure through its lending conditionalities the financial viability of institutions involved in waste management. In this regard, particular emphasis was placed on appropriate pricing policies and the establishment of effective management through provision of TA.

---

29 CDBs Housing Sector Policy Paper, April 1981, p. 7.

As a proportion of total direct allocations to the social sector for the period 1970-2000, the health sector received 19.1%, second to education which received 69%. When indirect lending to the other two subsectors - education and housing, are taken into account, the proportion of social sector funding allocated to health drops significantly to 12.4%, ranking third behind education (58.9%) and housing (28.7%). As a percentage of total allocations for the 1970-2000 period, health accounted for 2.3%. Hence the health sector so far has not figured prominently in CDB's portfolio.

Of the $49.8mn allocated to the health sector during 1970 to 2000, $42.7mn was earmarked for the development of sanitary health facilities (sewerage, land fills, sewage ponds etc.). Funding for the development of these facilities was targeted mainly at the OECS countries which received $22.8mn or 53.3% of the resources earmarked for waste management. The major project was the OECS Solid Waste Management project funded jointly at a cost of $16mn by the World Bank, the Global Environmental Facility and the CDB. The project focused on development of physical (landfills) and institutional infrastructure for effective management of solid waste which, in addition to the expected improvement in public health, was meant to achieve environmental enhancements critical to the continuing development of the tourism industry. Apart from the OECS, the other major beneficiary of funding in the health sector was the Cayman Islands with a sizeable sewerage development project approved in 1984.

The other interventions in the health sector (28.2% of allocations) related to the medical facilities subsector. In this category of projects, the two major allocations were for the rehabilitation of medical facilities after Hurricane Georges in St. Kitts in 1998 ($1.6mn) and for comprehensive Health Sector Reform in Belize ($5.6mn). The latter project represented a significant departure on the part of CDB in health sector lending. The project has sought to provide enhanced access to health services for the poor, to achieve increased efficiency in the health sector through organizational restructuring and strengthening, and to reduce the budgetary burden on Central Government through financing reform (establishment of National Health Insurance).

The Financial Sector

Overview

During 1970 to 2000, approximately 22% of CDB's total approved loans have been indirect loans made available to the final users through the intermediation of DFCs or, less often, commercial banks, governments or other intermediaries. The indirect channel has been the second major channel of disbursement after direct project lending to Governments. By comparison, the third most important channel of loan disbursement has been direct lending to the private sector, accounting for slightly less than 6% of sectoral commitments. The indirect channel has also been strategically very important, permitting CDB to finance a series of programmes, especially in the social and MSE sectors, which it would not have been able to do by direct lending. Indirect lending thus occupies an important role in the Bank's set of financial tools, although it has not always been an easy

one to use, as evidenced by numerous reports pointing to a series of problems that have arisen in this area through the years of operations. Nonetheless, CDB remains strongly committed to the indirect channel as a major conduit of funds distribution, and continues its effort to maintain its use as a part of its strategy to improve the regional financial sector.

The Rationale for Indirect Lending

Support for intermediaries in the regional financial sector is explicitly catered for in the Charter of CDB. Moreover, CDB's policy for direct lending prescribes that no loans under the size of $200,000 are to be undertaken. This limit is dictated by the limited availability of human resources to supervise directly a vast portfolio of small loans, and by prohibitive monitoring and supervision costs, which would raise the total cost of funds to borrowers disproportionately. Finally, in many BMCs, there has been in the past a demand for credit that could not be satisfied through other channels, such as commercial banking, either because they were unable or unwilling to cater to certain segments of the population or the economy. Fundamentally, indirect lending has been an essential instrument giving access to credit to those in the lower income brackets. Thus, indirect lending fits very well within the Bank's overarching mission of poverty reduction in the BMCs. Additionally, funds have also been channelled through the DFCs to satisfy social development needs, such as housing and higher education, at the lowest possible cost.

Geographical and Sectoral Breakdown of Resource Allocation through the DFCs

During 1970-2000, CDB approved lines of credit accounting for approximately 22% of its total commitments. Taken together, these loans made up almost 26% of all contributions to the productive sector (industry and tourism plus agriculture, forestry and fisheries, mining), and over 36% of all resources assigned to the social sector (health, education and housing).

Indirect lending has been a very important channel of CDB funds, especially in Jamaica, the British Dependent Territories and in the Bahamas. In Jamaica, roughly 28% of all CDB resources went through this channel. In the British Dependent Territories and in the Bahamas, almost 30% and 40% of CDB funds respectively were channelled in this way. On the other hand, this channel was little used in Barbados, where it accounted for slightly more than 4% of CDB resources allocated, and in Guyana, where no lines of credit have been approved since 1990. The proportion of indirect lending to the OECS and the British Dependent Territories increased from 28% in the seventies to 46.0% in the nineties. This happened mainly because DFCs in those territories did not initially have enough managerial and administrative capacity and technical expertise. Concomitantly, Jamaica and Belize over the same period saw their respective shares of indirect lending shrink from 18.0% and 29% to 11% each (excluding the funds made available to the Government of Jamaica for indirect lending to small sugar growers).

Indirect lending has been an important instrument of CDB's social improvement policies, and in some countries it represented by far the main channel of disbursement of CDB's funding in those sectors. In the British Dependent territories, indirect lending accounted for almost 63% of all social spending by CDB, and for the totality of educational and shelter spending, through the student loans for higher education and mortgage finance programmes administered by the local development finance institutions. Student loans for higher education administered by DFCs were also a major part of educational spending in the OECS and in Belize.

In some countries, indirect lending was also a very important part of CDB's lending to the productive sector, making up about 42.0% of all productive sector loans in Jamaica (excluding loans for support of small sugar growers, administered directly through the government), over 55% of support to the productive sector by CDB in The Bahamas and almost 27.0% of productive sector loans in Belize.

Priorities and Funding Over the Years

During 1970-2000, the portion of lending through financial intermediaries was roughly constant across the decades, with the amount of funds approved for indirect lending growing in parallel with general resource availability. What changed over time was the relative importance of the channel in financing various sectors, the sources of funding and, to a lesser extent, the geographical distribution of commitments.

The funding made available for indirect lending has traditionally been a mix of hard and soft resources, enabling DFCs to face better repayment terms. Still, it has almost never been CDB's policy to allow the on-lending of funds at below-market rates, and the DFCs have been encouraged to follow this practice and eventually reinvest in their own operations any excess generated.

The importance of the channel in financing social development has already been mentioned. In fact, in the seventies almost half of the financing for the social sector passed through DFCs, and in the eighties, 60% of social development resources were directed through the DFCs. During the last decade, the relative importance of indirect lending in the social sector decreased to 30% of the total, mostly because of the shift from productive and infrastructural projects to direct social spending that characterised CDB's policy in this period.

The importance of the social sector in indirect lending can also be seen in policies regarding the allocation of funds. In face of the rapidly falling level of concessionary resources, these funds have been concentrated in social sector spending; but this phenomenon took a particularly important dimension in the indirect lending segment. Here, soft resources rose from 20% of social spending in the seventies, to 36% and 66% in the last two decades, respectively. In fact, basically no soft funding has been made available for productive sector lending since 1993, so that all soft resources available have been used in the social development sector, making funds for social development to DFCs one of the "softest" mixes of resources currently made available by the Bank.

Issues in DFC Lending

Regular reviews of DFC's operations and policies by CDB highlighted over the years a set of problems including: inadequate government support; weak management; a lack of clearly defined policies; weak capital structure and a small asset base. Moreover, DFCs were often regarded by their respective Governments as lenders of last resort, who should extend high-risk, long-term loans at below market rates. In turn, this led the DFCs to experience a number of problems, including excessive levels of arrears and narrow operating spreads, leading to continuous losses, poor liquidity and decapitalisation of equity.

CDB has always been cognizant of these issues, and directed resources, both financial and human, to help strengthen the DFCs both as a valuable channel of funds and as an essential part of its efforts to develop the regional financial sector. As a part of its efforts in the sector, CDB, after thorough research, formulated sets of operational policy guidelines for the DFCs, as well as minimum compliance parameters for lending. The first sector policy paper was released in 1981 and a review performed in 1994. The policy guidelines have been used as the basis for the effective management of the DFCs. Also, in 1979 CDB created a DFCs Unit in order to better supervise operations in the sector. The Unit later became the Financial Intermediaries Unit, and is today in charge of supervising all indirect lending and financial sector operations of CDB. Technical assistance in the form of grants and loans continues to be extended to DFCs, helping to develop managerial information systems and satisfy automation needs, as well as solving organizational and capacity problems.

New Channels of Lending

CDB considers the DFCs to be an important channel of funds, and recognizes the positive role that has been played by these institutions. CDB will continue using financially viable DFCs as channels for its funds. The Bank will also continue with efforts to improve DFCs' performances.

At the same time, new initiatives are being undertaken. In particular, the two most relevant initiatives of recent years in the sector have been the use of private banks as intermediaries and the expansion of the Micro and Small-scale enterprises loans scheme. The first loans to private banking institutions started in the second half of the nineties. This programme had the main objective of expanding the range of available distribution channels, and presented the added benefit of strengthening the regional financial sector. The programme is proving successful, and has been absorbing a considerable amount of CDB's resources in recent years. The loans are primarily targeted at export-oriented industrial and service companies, and offer the opportunity to DFCs to join in partnerships with the commercial banks in "packaging" the loans, thereby achieving the double objective of making bigger loans possible and exposing the DFCs to valuable experience and expertise.

The MSE programme, on the other hand, encourages the "grass-roots" development characteristics of indirect lending. The programme was launched on the occasion of the third replenishment of the Bank's Special Development

Fund, under the heading of the "Small Scale Enterprise Development Programme". It was intended to formalise within a more precise framework the ongoing concern of CDB for providing support to small scale economic activities across the Region through its indirect loan schemes such as the Small Industry Credit and Agricultural Productivity Credit. Sub-loans from the MSE programme are aimed at very small scale businesses in any sector. They often include grant elements for strengthening MSE lending and supervision capacity of DFCs and are at times administered in collaboration with credit unions or NGOs specialised in micro-enterprise financing, as in the case of Belize. Again, this approach permits DFCs and other organisations to gain expertise and profit from mutual exchange.

Multisector

The multisector category of allocations is a residual category that captures a variety of CDB interventions that are not easily captured elsewhere under the Bank's current system of categorization essentially because of their multifaceted nature. Multisector approvals were quite large, particularly in the last two decades, totalling $320.3mn or 16.7% of total approvals over the 1970-2000 period. An estimated $117.9mn or 36.8% of multisector approvals were for TA in BMCs covering a wide range of tasks in both the public and private sectors and also regional institutions (CARICOM, OECS). As indicated in previous discussions, the Bank in a number of sectors has used TA as an integral part of its interventions in many instances. TA, in fact, has helped to ensure in many cases the success of the Bank's interventions. Most of these allocations (79.4%) during 1970-2000 were in the form of grants, the remainder being part of project loans.

The second largest category of multisector approvals was for the establishment or strengthening of disaster management and for post disaster rehabilitation. An estimated 24.8% or $79.5mn of multisector approvals was used for this purpose. The Bank sees its involvement in this activity as critical for the protection and maintenance of the Region's assets so as to minimise loss and destruction together with their negative economic and social impacts. The majority (56.8%) of the resources allocated to disaster management and post disaster rehabilitation was used in the Bank's LDCs (OECS and Dependent Territories). The third major category of multisector approvals totalling ($45mn) or 14.7% of multisector approvals, was for structural adjustment in Dominica (1987) and Guyana (1990). A somewhat similar type of loan was made available in 2000 to Jamaica ($25mn), 7.8% of multisector approvals, for financial sector reform. In 1999, Jamaica also received a loan of $14.1mn, or 4.4% of multisector approvals, for its Social Investment Fund, targeted at poor communities. The remaining $38.8mn or 12.1% of multisector approvals was for a wide variety of projects which have not been categorised.

V. CHALLENGES FOR THE MEDIUM TERM

Despite the difficulties that beset the Region during the 1970-2000 period, the economic circumstances of the Region improved. Reflecting this fact, donors in recent years have been willing to graduate the Region from the receipt of aid, preferring to focus their resources on Africa, Russia and Eastern Europe. While there has been a general improvement in economic circumstances in the Region, however, unemployment and poverty remain major problems in many countries and the performance of the social sector, though significantly improved, as compared with three decades ago, is still in many cases less than satisfactory. The foregoing underlines the importance of CDB's continued emphasis on poverty reduction and social sector development for the foreseeable future. Current medium-term prospects for the Caribbean economy also suggest the need for CDB not only to maintain this focus, but where possible, to deepen its involvement in the reduction of poverty which is likely to be exacerbated because of trade liberlisation.

Current economic prospects also point to the need for the Bank to address in the medium term, on a region-wide basis, the stabilisation and structural adjustment requirements of its BMCs. In the past, the Bank has generally played a minor role in this regard. However, current circumstances suggest the need for a deeper involvement especially as regards the provision of financial resources.

This, of course, leads naturally to the next major challenge facing the Bank - the need to increase its access to financial resources. There is clearly an urgent need to engage in strategies to expand the resource base. In this regard, the Bank has a few options with varying degrees of appeal. The general mood of donors regarding the replenishment of the Bank's special development fund suggests a definite decline in popularity in this mode of resource mobilisation. In light of this fact, the Bank will have to expand its membership base. As a consequence, CDB may have to revisit its original position with regards to its statutory limitations on non-regional ownership of the Bank's capital. Noteworthy is the fact that most MDBs including the IDB as well as the African and Asian Development Banks grappled with this same issue during the early eighties. Interestingly, the result in all cases was a ceding of both voting rights and a substantial increase in capital subscription by non-regional members. Alternatively, CDB in the future, may have to resort to increased market borrowing in order to satisfy its lending requirements. This, however, may alter the attractiveness of Bank funds particularly as it relates to pricing. The broad challenge will be to employ creative and imaginative ways to raise loanable funds at minimum cost.

Another important challenge facing the Region and the Bank in the medium to long term will be the issue of the Region's competitiveness. The response to this issue will determine the economic survival or demise of the Region. The issue of competitiveness is not confined to the traded sector which is merely the frontline of the economic competition struggle, but ultimately encompasses every

facet of economic activity and hence will need to be addressed comprehensively.[30] Specifically in the case of the Bank, projects must increasingly focus on the likely impact of CDB's interventions on a country's competitiveness in whatever sector the intervention takes place. Project design will need to seek to maximise this element of a project's impact. More specifically, the Bank will need to ensure that it has or develops the necessary expertise in critical economic sectors (agriculture, manufacturing, tourism) that will allow it to engage in optimal project design.

Economic Infrastructure

The major task facing Caribbean Governments with regards to economic infrastructure is the attainment of maximum efficiency in the provision of economic infrastructural services so as to minimise producer costs and, in particular enhance export competitiveness. In this regard, the first specific challenge for CDB and its BMCs is the effective and timely implementation of projects. There is need to reduce delays in project implementation so as to minimise cost overruns. Improvement in the institutional framework through which projects are implemented and policy dialogue between CDB senior management and national authorities can assist greatly in the endeavour to ensure that conditions precedent to disbursements are fulfilled within reasonable time, that selection of consultants and/or contractors takes place expeditiously and that proper supervision and management are in place.

A second challenge is the maintenance of projects to ensure sustainability of infrastructural services. While CDB has requested that budgetary allocations be set aside specifically for maintenance, there is no guarantee that these allocations are expended on actual maintenance, especially in times of fiscal difficulties. Hence, the focus has to move beyond budgetary allocation for maintenance of projects to include ensuring overall fiscal improvement in BMCs.

An important challenge for CDB is increased focus on institutional reform in the management of physical infrastructural projects to ensure efficient operation. CDB must not only be satisfied to oversee the successful completion of a project but must seek to ensure continued efficiency in the provision of infrastructural services. Ensuring institutional and policy reforms in pursuit of cost effectiveness must be a major goal for all economic infrastructure projects.

In order to expand its customer base and increase its effectiveness as a channel of development funds, the Bank will also need to review some of its lending policies. For example, if CDB is to play a significant role in financing utilities in the future, it will need to review current policy, given the private-sector status of these entities. CDB's lending to the private sector has been limited because of risk considerations. However, the needs of the Region's utilities are larger than allowed for by CDB's policies. The risk associated with lending to

---

30 For a comprehensive but by no means exhaustive discussion of competitiveness issues in the Caribbean, see "Improving Competitiveness for Caribbean Development", Report of the Caribbean Trade and Adjustment Group, RNM and Caricom Secretariat, 2001.

utilities may be smaller than that of other private-sector entities because of their monopoly status and the low price elasticity and high income elasticity of their product. Hence, there may be scope for increasing the lending limits to private utilities beyond those of other private-sector entities, a strategy worth pursuing, given the substantial experience resident within the Bank in the area of utility financing and development.

Social Sector

Health

While traditionally the intervention priority of CDB in public health has been on sanitation, a totally new kind of challenge will have to be faced in the near future as the HIV/AIDS/ epidemic develops in the Caribbean region. UNAIDS reports that the Caribbean Basin Region shows the second highest prevalence rate (the percentage of infected persons aged 14 to 44) in the world after Sub-Saharan Africa. In fact, the University of California, San Francisco reports that HIV is the primary cause of death among the young in the English-speaking Caribbean.[31] Recent estimates show that over 7% of pregnant women in urban Guyana tested positive for HIV. In The Bahamas, the adult prevalence rate is 4%, while Barbados, Belize, Trinidad and Tobago and Suriname[32] have an HIV prevalence in excess of 1%, over four times the Western Europe average of 0.23%. In Haiti, the most widely affected country in the Region, the average prevalence rates in urban areas is 8%, with up to 13% of tested pregnant women found HIV-positive in some areas.[33] While in most countries the situation is problematic, the epidemic is not already of devastating proportions, and the most recent developments on the availability of generic retroviral drugs suggest that at least part of the social catastrophe potentially underlying those figures could be avoided. However, the financial costs involved will surely be huge, especially if the epidemic is not stopped from spreading. There will be need for many interventions in this area in the short, medium and long term, to sustain prevention, medication and other connected forms of remedial action, including support for AIDS orphans and public education and awareness campaigns. Donors will have to upkeep their support for the health sector, and new ways to reach out to poorer communities will have to be found in order to diffuse prevention measures as much as possible. Action will need to be fast as well, or the epidemic could seriously endanger in a very short time the economic and social gains achieved by Caribbean countries over the last 30 years.

---

31 Source: University of California San Francisco AIDS epidemic monitoring programme, website - http:/hivinsite.ucsf.edu/insite.jsp?page=country

32 Suriname and Haiti are prospective members of CDB.

33 Sources: UNAIDS - Report on the Global HIV/AIDS Epidemic - June 2000", UNAIDS - 2000, Geneva; UNAIDS - AIDS Epidemic Update - December 2001", UNAIDS - 2001, Geneva.

Housing

The major challenge for housing continues to be the provision of adequate housing at affordable cost to the lowest income earners. In this regard, CDB has to focus on a coherent planning/policy framework for housing in BMCs to address the following issues:

(a) implementing mechanisms for cost reduction through project designs;

(b) ensuring that the low income households are the major beneficiaries of CDB financing for housing;

(c) the development of institutional capacity in governments' management of housing development; and

(d) the development of appropriate housing sector policies (availability of serviced plots, zoning and building standards, etc.).

The Financial Sector

While improvements in performance have been registered by the DFCs, and CDB has surely been acquiring important experience in operating in the regional sector, the road ahead is surely a challenging one. Financial sector liberalisation is modifying the sector's landscape, as seen, for example, through the increased regional mobility of funds. While at this time it is not possible to predict the impact of these changes on the DFCs with any certainty, CDB's interventions aimed at institutional strengthening will need to continue, so that the DFCs can meet the new challenges and remain financially robust. Moreover, with trade liberalisation leading to increased vulnerability of some of the poorest segments of the population, CDB will need to strike a balance between support to growth and strengthening of the economies at large, and interventions targeted at those who cannot immediately enjoy the benefits of those interventions. The DFC channel, with its ability to lend to small borrowers and proven track record in social sector operations, is well placed to continue fulfilling a key role within this context. However, in this environment of uncertainty, the search for new channels of fund distribution should continue by directly targeting other lenders that operate within the desired low-income population segment, such as NGOs and the Credit Unions, especially those with a proven track record. This can lead not only to establishing alternative channels of funds in those circumstances where it would seem impossible to establish financially viable DFCs, but it would also ensure diversification and enhanced management of risk by the Bank and a more solid basis for the Bank's initiatives in poverty reduction and social sector development.

VI. CONCLUSION

In its more than thirty years of operations, the Bank has been faithful to the dictates of its Charter. It has been an increasingly important mobiliser of external funds for the Region, though more so for the LDCs than the MDCs, and in so doing has contributed to the Region's growth and development. In addition to the provision of financing, it has also been an important source of technical assistance which has helped to enhance the impact of its interventions. The Bank through its persistent nurturing of the DFCs has contributed to the development of the financial sector in the Region. Through direct funding and through infrastructure development, the Bank has also contributed to the expansion of the Region's external sector. Further, the Bank has been an important contributor to social sector development in areas such as housing, human resource development and in efforts to reduce poverty. An area of disappointment has been its inability to contribute more substantially to the process of regional integration and economic diversification. Its current involvement in the implementation of the Caribbean Single Market and Economy, however, shows its continued commitment to regional economic integration even as it confronts yet another decade of challenges.

Bibliography

Bourne, Compton. "The Future of Development Banking in the Caribbean," in Caribbean Development Bank, Whither the CARICOM Region: Whither CDB in its Support, (eds.) K.Worrell and A. Gonzales, Caribbean Graphics Productions Ltd., Barbados, 1996, p. 67-77.

Caribbean Development Bank. 1981. Housing Sector Policy Paper, Caribbean Development Bank, Barbados.

Caribbean Development Bank. *Statements by the President, 1971-80.* Letchworth Press Ltd.

Caribbean Development Bank. *Statements by the President, 1980-89.* Barbados: Cole Printery.

Caribbean Development Bank. *Statements by the President, 1990-99.* Barbados: Cole Printery.

Caribbean Development Bank. *Annual Report, 2000.*

Caribbean Tourism Organisation. *Caribbean Tourism Statistical Report, 1999-2000.*

Caribbean Trade and Adjustment Group. *Improving Competitiveness for Caribbean Development*, Regional Negotiating Machinery (RNM) and CARICOM Secretariat, 2001.

International Monetary Fund. *Financial Statistics Yearbook, 1992.* Washington D.C.: IMF Publication Services, 1992.

World Bank. *The Economic and Social Development of the Leeward and Windward Islands,* Vol. II, June 1975.

World Bank. *The Commonwealth Caribbean, The Integration Experience.* Baltimore: John Hopkins University Press, 1978.

UNAIDS. Report on the Global HIV/AIDS Epidemic, UNAIDS, Geneva, June 2000.

AIDS Epidemic Update. UNAIDS, Geneva, December 2001.

University of California, San Francisco, AIDS Epidemic Monitoring Programme, website: http:/hivinsite.ucsf.edu/insite.jsp page country, August, 2001.

Appendix

Abbreviations

Dollars ($) throughout refer to United Stated (USD) dollars

AIC	-	Agriculture, Industry and Commerce
BMCs	-	Borrowing Member Countries
bn	-	billion
BNTF	-	Basic Needs Trust Fund
CARICOM	-	Caribbean Common Market
CARIFTA	-	Caribbean Free Trade Area
CDB	-	Caribbean Development Bank
CTCS	-	Caribbean Technological Consultancy Services
DFCs	-	Development Finance Corporations
EU	-	European Union
GDP	-	Gross Domestic Product
HRD	-	Human Resources Development
IDB	-	Inter-American Development Bank
IMF	-	International Monetary Fund
LDCs	-	Less Developed Countries
LIAT	-	Leeward Islands Air Transport
MDCs	-	More Developed Countries
mn	-	million
MSE	-	Micro and Small Enterprises
OCR	-	Ordinary Capital Resources
OECS	-	Organisation of Eastern Caribbean States
SFR	-	Soft Fund Resources
UNAIDS	-	United Nations AIDS Agency
US	-	United States
UWCH	-	Urban Working Class Housing
WISCO	-	West Indies Shipping Company

5

Finance, Investment and Economic Development: Towards an Investment-Friendly Financial Environment

Sir Courtney N. Blackman

Introduction

This paper examines the inter-relationship between finance and investment with a view to formulating an appropriate policy-mix for the promotion of economic development in developing countries such as those of CARICOM. The theoretical framework we employ is in sharp disagreement with the McKinnon-Shaw thesis which attributes the ills of LDCs to "financial repression", and prescribes the comprehensive deregulation of financial markets as a precondition, indeed the requirement, of economic growth. Since the McKinnon-Shaw thesis has underpinned the structural adjustment programmes imposed by the IMF, World Bank and IDB on several LDCs, including some Caricom States, it cannot be left unchallenged. We agree with the judgement of Nobel Laureate J.E. Stiglitz (1994) that

> ...much of the rationale for liberalising financial markets is based neither on a sound economic understanding of how these markets work nor on the potential scope for government intervention. Often, too, it lacks an understanding of the historical events and political forces that have led governments to assume their present role. Instead, it is based on an ideological commitment to an idealised conception of markets that is grounded neither in fact nor in economic theory. (pp. 19-56)

Our first task is to lay bare the dynamics of investment, savings and finance in relation to economic growth. Secondly, we critique the McKinnon-Shaw thesis. Thirdly, we develop a policy framework based on the dynamics of investment, savings and finance in developing countries. Finally, we identify ten minimal elements of an investment-friendly financial environment.

Investment, Savings and Economic Growth

If there is one thing known about economic development it is that investment must increase relative to consumption as a proportion of the national income. Investment, in the words of John Maynard Keynes, is the engine of growth. Investment is made possible through savings. According to Sir Arthur Lewis (1954), no industrial revolution can be understood "until it can be explained why savings increased relative to the national income." Economic development, then, is about accelerating the rate of savings and investment, i.e. of capital formation.

The equality of savings and investment is a fundamental proposition of Keynes' (1936) *General Theory;* indeed, he had great difficulty explaining this equality. The Swedish School came to his assistance with the *ex ante* and *ex post* analytical device: whereas savings and investment may diverge *ex ante* (since savers were not necessarily the same as investors), equality between the two variables would be restored *ex post.* If part of *ex ante* savings remained un-invested, there would be a corresponding decrease in income, leading in turn to reduced savings and restoration of equality between savings and investment *ex post.* Similarly, should investment exceed savings *ex ante,* the resulting increase in income would raise savings proportionately, thus restoring the equilibrium between savings and investment *ex post.* Keynes is effectively saying that not only are savings and investment equal, but they are really two aspects of the same phenomenon. It is therefore as true to say that investment is a function of savings as to say that savings is a function of investment. The two phenomena cannot be divorced from each other. Our study, therefore, simultaneously seeks to discover the appropriate climate for both savings and investment.

It was Sir Arthur Lewis who contrasted the savings/investment problems of developing economies and of advanced capitalist economies, the latter of which were the concern of Keynes. Whereas developed countries enjoy unlimited supplies of capital, LDCs possess unlimited supplies of labour.

The operative constraint on economic growth in advanced economies is the availability of labour. Because of the residue of productive capacity accumulated during successive waves of investment over several decades and even centuries, and since they are capital goods producers, advanced economies enjoy unlimited supplies of capital. The economies of the 1930s, with which Keynes was concerned, were operating at extremely low levels of capital capacity; the problem was therefore one of stimulating effective demand so as to put both capital and labour back to work, and it could confidently be anticipated that full employment of labour would be achieved before maximum capital capacity was utilised and inflation entered the picture.

However, the operative constraint on economic growth in LDCs is capital. Should the Central Bank turn on the money spigot, production capacity would be used up long before full employment was reached; further expansion of the money supply would therefore lead to inflation and, since the marginal propensity to import is usually high for LDCs, to the collapse of the balance of payments.

The Lewis prescription is beautifully simple in conception. Observing considerable disguised unemployment in the traditional sector (that the marginal product of labour was zero or less), he suggested that capital imports might be combined with the superfluous labour of the traditional sector, thus enlarging

the modern capitalist sector and expanding aggregate income. Lewis, the economic historian, also noted that even rich urbanising societies, like Australia and Canada, had traditionally imported massive amounts of capital to meet the requirements of social capital investment.

Direct foreign investment was for Lewis the preferred type of capital import, since the foreign investor brought with him not merely liquid capital but technology, management and, above all, access to markets. Direct foreign investment is certainly superior to foreign loan capital in that business failures do not become liabilities of nationals nor of the national government. Europeans lost vast sums in failed American investment, but these did not enter the US national foreign debt accounts.

Lewis also anticipated that local entrepreneurs would learn the "tricks of the trade", and would in time develop the capacity to establish enterprises which would progressively reduce the initial dependence on foreign capital. In short, they would learn the art of investment even as they absorbed the capitalist ethic of savings. Lewis is reported to have said that it was in South Korea that he witnessed the full realisation of his theory. There, indigenous enterprises, established with the assistance of foreign capital, now challenge the multinationals on almost equal terms.

Finance and Development

It is to be noted that both Keynes and Lewis focussed on *real* savings and *real* investment rather than *financial* savings or *nominal* investment. Keynes specifically rejected the classical proposition that savings and investment were brought into equilibrium through the interest rate mechanism: investment, he contended, depended largely on the "animal spirits" and expectations of investors, while the readiness of savers to lend depended on their liquidity preference. Savings and investment were equilibrated, he showed, through changes in aggregate income. Keynes therefore favoured a low interest rate regime that promoted investment. Similarly, finance is excluded from Lewis' basic two-sector model. Even Milton Friedman, the arch-monetarist, agrees with Keynes and Lewis:

> ...what happens to output depends on real factors: the enterprise, ingenuity and industry of the people; the extent of thrift; the structure of industry and government; the relations among nations; and so on.

Financial considerations are introduced into the investment/growth argument when the ambitions of investors exceed the capacity of their own equity and retained earnings, and as they are forced to borrow from other economic units and households with surplus earnings. The investment decision, then, as Professor Hyman Minsky aptly puts it, is "a decision both to acquire tangible assets and to emit financial liabilities."

As an economy develops, the gestation period of investment projects tends to lengthen and the payback period to become more extended. Surplus lending units must therefore be persuaded to hold the liabilities of deficit spending units over longer and longer maturities. More and more, then, intermediation between

savers and investors is accomplished through institutions comprising the financial markets.

Professors J. G. Gurley and E. S. Shaw (1955) have shown that just as corresponding waves of real investment leave a residue of capital in the form of productive capacity, corresponding waves of financing decisions similarly leave a residue of debt. This residue of debt makes an imposition on the economy's financial capacity to sustain the liquidity of that debt, that is, savers must be persuaded to hold debt for very long periods of time – up to thirty years in the case of corporate bonds, and indefinitely in the case of equity. Their incentive to do so is greatly increased if, in the event of some contingency, their loan assets can be readily liquidated without significant loss of value. To sustain the liquidity of debt of increasingly extended maturities, financial markets must be both wide and deep. We should note, however, that the development of financial markets is glacially slow.

Since a portion of the residue of debt in a capital importing economy will be foreign, it goes without saying that enough of the national product must be exported to service this foreign debt and to reduce future dependence on foreign capital. An export-oriented strategy is therefore the only game in town for LDCs like those of CARICOM.

Critique of the McKinnon-Shaw Thesis

In his influential work of 1973, *Money and Capital in Economic Development"*, McKinnon invented the term "financial repression." He describes his thesis as follows:

> When governments tax and otherwise distort their domestic capital markets, the economy is said to be financially "repressed". Usury restrictions on interest rates, heavy reserve requirements on bank deposits and compulsory credit allocations interact with ongoing price inflation to reduce the attractiveness of holding claims on the domestic banking system. In such a repressed financial system, real deposit rates of interest on monetary assets are often negative and are difficult to predict when inflation is high and unstable. Thus, the demand for money – broadly defined to include savings and term deposits as well as checking accounts and currency – falls as a proportion of GNP.

But these monetary assets naturally dominate the financial portfolios of small savers in less developed countries. Thus, back in 1973, Edward Shaw and I hypothesized that repressing the monetary system fragments the domestic capital market with highly adverse consequences for the quality of real capital accumulation.

McKinnon therefore prescribes the following:

> Remedying financial repression is implicit in its definition. We suggest keeping positive and more uniformly high real rates of interest within comparable categories of bank deposits and loans by eliminating undue

> reserve requirements, interest ceilings and mandated credit allocations on the one hand, while stabilising the price level through appropriate macroeconomic measures on the other. Then, savers and investors would better "see" the true scarcity price of capital and thus reduce the great dispersion in the profitability of investing in different sectors of the economy.

Acceptance of the McKinnon-Shaw paradigm has led several developing countries, including some within CARICOM, to institute financial reforms involving the removal of ceilings on interest rates, the deliberate promotion of positive and high real interest rates, the removal of exchange controls on capital movements and the floating of the national currency. The basic premise of financial liberalisation is that market-determined outcomes would optimise the rate of savings, investment and economic growth in developing countries.

Epistemology

It is remarkable that so simple a theory of a phenomenon as complex as economic development should exert so pervasive an influence as the McKinnon-Shaw paradigm of "financial repression." Indeed, it collapses quite rapidly before epistemological assaults from Professor Stiglitz and Dr. Mary Zephirin (Central Bank of Barbados). They contend that the implication of the McKinnon-Shaw thesis that the free market outcome is Pareto optimal, holds only under rigorous conditions of market "perfection". In fact, the initial conditions that McKinnon and Shaw seek to alter are themselves a manifestation of severe market imperfection. It is therefore quite possible, Stiglitz and Zephirin show, that government intervention could produce sub-optimal outcomes more favourable than the McKinnon-Shaw "free-market" solution. Indeed, the issue is not whether Government intervenes in the market, but whether or not it intervenes intelligently. According to Gibson and Tsakalotos,

> ...the South Korean case illustrates that government credit allocation schemes need not lead to a decline in the quality of investment and can be important in promoting capital accumulation and growth in the early stages of development.

When the first outcomes of "financial liberalisation" turned sour, McKinnon invoked the intervention of Government to enforce prudential regulation and to promote macroeconomic stability. McKinnon cannot have his cake and eat it too. He cannot initially insist upon the withdrawal of Government from the market and later invoke Government intervention in the instances of market failure.

Exchange Rate Regime

The exchange rate regulates the relationship between imports and exports, and takes on increasing importance as the ratio of foreign trade to national income rises. In particular, it determines the price of capital imports, the critical input into the production processes of LDCs, who would therefore wish it to be both inexpensive and stable in price.

Since the Keynesian model is a closed system, there was no serious discussion in the *General Theory* of an appropriate exchange rate regime. Keynes' concern was that commitment to a fixed exchange rate should not elevate the real interest rate to a level inconsistent with full employment. He noted the wisdom of Mercantilists:

> ....their intense preoccupation with keeping down the rate of interest by means of usury laws ... by maintaining the domestic stock of money and by discouraging rises in the wage-unit; and in their readiness in the last resort to restore the stock of money by devaluation, if it had become plainly deficient through an unavoidable foreign drain, a rise in the wage-unit, or any other cause.

Neoclassical economists welcomed the collapse of The Bretton Woods System in 1971 and the transition to a floating rate regime. They were confident that the "free market" would promote exchange rate stability and that, in any event, exchange rate risks could be effectively hedged in the forward markets. The turbulence in global currency markets in recent decades is testimony to neoclassical mis-calculation.

Exchange rate volatility is most destabilising for LDCs. In Lewis' basic two-sector model, conceived in the early 1950s, money is neutral and fixed exchange rates are assumed. However, in his 1978 publication, *The Evolution of the International Order,* Lewis considers free floating exchange rates "a nuisance for countries with no organised forward markets."[1] (p. 53) Lewis was therefore wary about the use of the exchange rate by LDCs as a means of balance of payments adjustment over the trade cycle. "Besides", he noted, "devaluation is a dangerous medicine for an economy whose imports are large relative to national income." "Nowadays", he continues, "such an economy is likely to find itself on a treadmill, where devaluation raises money incomes and prices, so setting off further devaluation *ad infinitum."* However, he did indicate that devaluation might be necessary when the cost structure was in severe disequilibrium:

> "When one says of our economy that its money costs are too high in relation to world prices for it to be able to provide full employment, this is the classical definition of an "overvalued currency." (p. 54)

Blackman, in the First Adlith Brown Memorial Lecture (1985), demonstrated that for economies in chronic balance of payments disequilibrium, i.e., where the demand for foreign exchange could not be satisfied in the foreseeable future, the equilibrium exchange rate is indeterminate, and would not necessarily be achieved through currency devaluations. In these circumstances, he argued, policy measures should be directed primarily towards a parametric shift to the right of the supply curve for foreign exchange (e.g. increased export earnings) and a parametric shift to the left in the demand curve for foreign exchange (e.g.

---

1 Indeed, it is also a nuisance for countries with sophisticated forward markets.

external debt forgiveness). Various confidence-building measures might also impart greater elasticity in both the supply of and the demand for foreign exchange, prompting a movement towards equilibrium. But parametric shifts are, almost by definition, difficult and time-consuming. (See Charts 1, 2, and 3.) The experience of Guyana and Jamaica has confirmed this thesis.

Since the exchange rate is such an important price for the LDC, we cannot leave it to the vagaries of the market place, even though our options will be limited by the degree of turbulence in the international financial markets. However, we must do everything we can to maximise our options. Most obviously, we must try to maintain internal price stability. For LDCs, this means essentially that we should keep government deficits under control and restrain the excessive rise in money incomes. In the absence of a large war-chest of foreign exchange reserves for central bank market intervention, some rationing of existing reserves, and regulation of destabilising capital outflows and inflows, may also be necessary.

None of the above arguments rules out currency depreciation if real wage rates become hopelessly uncompetitive or the price of a major export commodity falls precipitously (e.g. oil prices for Trinidad and Tobago in the 1980s). However, such devaluations should be swift and deep enough to be credible rather than piecemeal and drawn out. Repeated currency depreciations through the "free market" are debilitating, requiring workers to surrender more and more of their product for a decreasing volume of imports. Experience has shown both in CARICOM and elsewhere that saving and investment flourish best in an environment of relative price and exchange rate stability.

Role of Interest Rates

McKinnon's most obsessive concern is with positive and high real interest rates. The logic of his argument is (1) that households do not save unless real interest rates are positive; (2) that higher saving leads automatically to increased investment; and (3) that increased investment leads to economic development.

The persistence of the first proposition is remarkable, since the relationship between the rate of interest and the volume of savings is clearly an empirical issue: sometimes people increase savings when real interest rates are positive; sometimes they increase savings when real interest rates are negative. Deena Khatkate (1980) observes:

> The evidence for developed and developing countries alike is not quite conclusive in regard to the interest elasticity of savings. For the United States, income and wealth are found to have a more predominant influence on personal savings than interest rates. For less developed countries, even allowing for the dubious nature of statistics, the evidence points toward the same kinds of doubt about the interest elasticity of savings.

Secondly, if the rate of interest on business loans significantly exceeds the marginal revenue of the enterprise, investment will not take place except in hyper-inflationary conditions where product prices can confidently be expected to increase. And since the rate of interest is itself a cost of production, rising

real interest rates act as a drag on production, especially in the case of small businesses which depend heavily on commercial bank loans.

Third, it is *real* savings, as we have seen, not financial savings, which promote growth. If there are no surpluses being generated in the real economy, there can be no real savings to invest no matter how high the real rate of interest. Moreover, as we have demon-strated above, the causal relationship between savings and investment does not flow only from the former to the latter, but also from the latter to the former (as well).

Fourth, it must be recognised that operational losses, both in the public and private sector, are tantamount to the destruction of capital. Just as productive investment promote economic growth, so will chronic operational losses plunge an economy into a downward spiral of decline.

Financial Market Efficiency

It is also naïve of McKinnon to think that the mere removal of interest rate ceilings and other forms of "financial repression" automatically results in competitive and effective markets. In this respect he is typical of neo-classical economists who neglect the institutional features of markets – a transgression which greatly irritates Nobel laureates R.H. Coase (1990) and James Buchanan (1979). Buchanan (1979) observes:

> A market is not competitive by assumption or by construction. A market *becomes* competitive, and competitive rules *come to be* established as institutions emerge to place limits on individual behaviour patterns. It is this becoming process, brought about by the continuous pressure of human behaviour in exchange, that is the central part of our discipline, if we have one, not the dry rot of postulated perfection.

Coase (1990) is even more caustic in his condemnation of the divorce of theory from the real world:

> The consumer is not a human being, but a set of preferences ... Exchange takes place without any specifications of its institutional setting. We have consumers without humanity, firms without organisation, and even exchange without markets.

McKinnon was on the right track when he observed that the financial markets of developing countries were fragmented, that is, that they are imperfect. Indeed, if their markets were not imperfect, these countries would be developed. But financial markets do not become perfect because they are deregulated, but as they expand, and as governments and participants devise and discover rules and practices which make them function better. As they become more competitive, they will allocate resources with increasing efficiency. That is why the New York Stock Exchange, the world's most efficient market, is also the most highly regulated.

Capital Flows

Finally, in prescribing the complete deregulation of capital flows and the floating of exchange rates, McKinnon shows insensitivity to the crucial importance of foreign exchange in the productive processes of LDC economies typified by openness. Since LDCs must import a preponderance of their capital and intermediate goods, only savings which are readily convertible into foreign exchange are generally usable for investment purposes. In the case of LDCs, therefore, savings are virtually the same thing as foreign exchange. This misunderstanding has also led financial liberalisers to greatly underestimate the current burden of external debt borne by LDCs. Historically, developing countries have been net importers of capital; for two decades now the highly indebted LDCs have been net exporters of capital. Yet the international community is puzzled by their failure to grow.

The McKinnon-Shaw Theory in Practice

As early as 1989 the World Bank commented that in the "far-reaching programme of financial reforms carried out by Argentina, Chile and Uruguay in the mid-1970s each programme encountered serious problems, partly because of the way in which financial deregulation was handled and partly because of problems in the real sector." In its study, *The East-Asian Miracle*, the World Bank also conceded that "financial sector interventions – specifically repression of interest rates and contest-based direction of credit – may have contributed to rapid growth in such economies as Japan, Korea, Taiwan and China."

McKinnon himself, the father of "financial liberalisation", now recognises that "our knowledge of how best to achieve financial liberalisation remains seriously imcomplete." However, this has not moved him to re-examine the premises of his original theory, but to reconsider "the order in which the monetary system is stabilised in comparison to the pace of deregulation." He has also learned that "fiscal control should precede financial liberalisation", and that "free foreign exchange convertibility on capital account is usually the *last* stage in the optimal order of economic liberalisation." The IMF itself has also recently conceded that capital controls may be necessary in certain circumstances. The McKinnon programme is now hedged around by so many caveats and contingencies that there is not very much left of the original theoretical structure.

On the Creation Investment-Friendly Financial Environment

The above theoretical analysis and the lessons of recent financial liberalisation allow us to outline an investment friendly macroeconomic policy mix.

Market Orientation

Although rejecting the McKinnon-Shaw *laissez-faire* doctrines, we declare a bias towards the allocation of resources through the market. The market is a social device for the inexpensive allocation of resources that reduces the burden

on a society's information systems and decision-making mechanisms. But the market is not infallible. Wherever the market allocates resources in a socially acceptable manner, we will use it; but we reserve the right to intervene where the outcomes of "free market" allocation are socially unacceptable. This will frequently be the case in LDCs, especially in small countries, where markets are usually monopolistic or oligopolistic. For example, the commercial banking system of any Caricom state will, for the foreseeable future, be oligopolistic, and so would that of an integrated CARICOM. CARICOM authorities cannot therefore leave the determination of interest rates to a "free market" comprising a few commercial banks that exercise overwhelming market power. Clearly, central banks must exercise countervailing power.

Financial Market Deepening

We accept the need for the deepening of financial markets as economic development proceeds. However, this process is slow and cannot be expected to create a decisive expansion of savings from indigenous sources in the short-run. For some time to come CARICOM must rely heavily on capital imports. In the meantime, measures must be put in place for the continuous improvement of financial markets. Not least of all will be the strengthening of prudential regulation of financial institutions.

Direct Foreign Investment

Direct foreign investment should be especially encouraged because of the by-products of technology, management and market access. Indeed, even advanced countries, like the UK, the USA and Canada, actively promote foreign direct investment. Local entrepreneurs may also obtain the benefits of foreign capital through joint-ventures, franchising, production under subcontracts, and through marketing alliances. Hopefully, in the process they will learn the "tricks of the trade", as Lewis puts it.

Credit Allocation

Because of the imperfection of financial markets, the allocation of scarce credit among various sectors of the economy cannot be left solely to market forces. Government must, through fiscal policy primarily, but also through selective credit arrangements if necessary, ensure that crucial industries are not starved of scarce capital resources. In particular, small businesses must have access to soft loans, accompanied by technical support to the greatest extent possible. This practice is followed even in advanced economies so as to create a nursery of future entrepreneurs.

Interest Rate Regime

We should especially eschew the dogma of high and positive real interest rates. Interest rates should be high enough to deter capital flight, but not necessarily to attract "hot" money that may be withdrawn on the slightest

provocation. High real interest rates cannot stimulate real savings unless surpluses are generated in the real sector. At the same time, high interest rates add to the cost of production, suppressing output and fuelling inflation. Monetary authorities must pragmatically balance the return to savers against the cost to investors. Most damaging of all, savings rates above a certain level render investment in the real sector irrational, and promote a situation as occurred in Jamaica in the early 1990s, when the financial sector boomed while the real sector stagnated.

Exchange Rate Regime

We must reconcile ourselves to the fact that only internationally traded currencies can realistically be floated on international currency markets. Indeed, we cannot even be sanguine of the stability of even major currencies like the sterling or the Euro. To be traded on international markets, currencies must either be backed by relatively stable traded currencies like the US dollar, be perceived to be exchangeable for goods and services in widespread demand, or be regarded as commodities in themselves, as is the US dollar. Caricom currencies are not held by foreigners as stores of value, and frequently not even used as units of account by Caricom nationals; strictly speaking they are not "floatable". For example, the Jamaican dollar does not "float" against the US dollar; in fact, the US dollar is a commodity bought and sold on the Jamaican financial market.

The best hope of achieving the stability of Caricom currencies is for their central banks to hold high levels of foreign exchange reserves for defending a given exchange rate or band of rates, as do Singapore and Taiwan, which currently hold reserves of US$74 billion and US$113 billion, respectively. Their holdings are much greater than those of the UK, whose sterling more resembles a commodity. Ironically, large reserves holdings are especially needed when strategic devaluations are required.

Even though exchange controls should be progressively liberalised, they should be maintained on major capital outflows, and excessive capital inflows should be sterilised. Sudden shocks to the balance of payments are more likely to come from global capital movements than from foreign trade, and in a liberalised foreign exchange regime any domestic funds or available credit can be used to purchase foreign exchange for effecting capital flight. Whereas we can see the build-up of imports coming from afar and take preventive measures, massive capital outflows can occur in the twinkling of an eye! For this reason the conventional measure of foreign exchange reserve adequacy – three months import cover – has been obsolete for some time now.

Fiscal vs. Monetary Policy

Since financial markets in Caricom will remain narrow and shallow for the foreseeable future, they will not provide a medium for the effective operation of monetary policy, and governments must rely heavily on fiscal policy for the execution of macroeconomic policy. Governments should avoid inflationary deficit

spending, and must generate the surpluses needed to finance infrastructure and to support, though not necessarily own, productive investment.

Conclusion

It is Suggested that an Investment- Friendly Financial Environment should Contain the Following Elements:

1. A stable or gently rising price level.

2. An interest rate regime with savings rates below 10% and loan rates under 20%.
3. A financial sector which expands *in tandem* with the real sector and becomes progressively deeper.

4. Progressive liberalisation of exchange controls, with maximum assurance that original capital, dividends and retained earnings will be remitted with a minimum of red-tape.

5. Arrangements for sterilising excessive inflows of hot money and for moderating massive and untimely capital outflows.

6. Either anchorage of the currency to a major internationally traded currency or to a basket of currencies together with the maintenance of high levels of foreign exchange reserves; or the operation of a managed float that modifies market overshooting and horrendous currency undervaluation. (It is remarkable that Neo-liberal economists, who are so traumatised by overvalued exchange rates, have nothing to say about grossly undervalued currencies).

7. Primary reliance on fiscal, rather than monetary, policy in the conduct of macro-economic policy.

8. Central banking arrangements with maximum independence from Government so as to minimise the likelihood of money creation for the financing of runaway fiscal deficits.

9. Regulatory arrangements which facilitate direct foreign investment.

10. Special arrangements for the financing and technical support of small and start-up businesses.

References

Blackman, Courtney N. 1986. "A Heterodox Approach to the Adjustment Problem", *First Adlith Brown Memorial Lecture,* Institute of Social and Economic Research, 1986.

Buchanan, James. 1979. *What Should Economists Do?* Indianapolis, Liberty Press, 1979, p. 29.

Coase, R.H. 1990. *The Firm, the Market and the Law,* Chicago, The University of Chicago Press, 1990, p. 3.

Friedman, Milton, *Money Mischief: Episodes in Monetary History,* New York, Harcourt, Brace & Company, p. 48.

Gibson, Heather D. and Euclid Tsakalotos. 1994. "The Scope and Limits of Financial Liberalisation in Developing Countries", *The Journal of Development Studies,* Vol. 30, No.3, April 1994, p. 611.

Gurley, John G., and Edward S. Shaw. 1955. *"Financial Aspects of Economic Development", American Economic Review,* September 1955, p. 523.

International Monetary Fund. 1995. *nternational Capital Markets: Development, Prospects and Policy Issues,* Washington, pp. 95-108.

Keynes, John M. 1964. *The General Theory of Employment, Interest and Money,* 1936, (Reprint), Harcourt, Brace & World, Inc., 1964, p. 39.

Khatkate, Deena. 1980. "Analytic Basis of the Working of Monetary Policy in Less Developed Countries", in Money and Monetary Policy in Less Developed Countries, W.J. Coats Jr. and D.R. Khatkate (eds.), Pergammon Press, Oxnard 1980, p.134.

Lewis, Sir W. Arthur. 1954. "Economic Development with Unlimited Supplies of Labour", eds. A.N. Agarwala, & S.P. Singh, *The Economics of Underdevelopment,* New York, O.U.P., p. 416.

_____. 1978 *The Evolution of the International Economic Order,* Princeton, New Jersey, Princeton University Press.

McKinnon, Ronald. 1973. *Money and Capital in Economic Development,* Washington, The Brookings Institution, 1973.

McKinnon, Ronald. 1991. *The Order of Economic Liberalisation,* Baltimore, John Hopkins University Press, 1991, pp.3-10.

Minsky, Hyman. 1967. "Money Market and Savings Intermediation", *Issues in Banking and Monetary Analysis,* eds. G. Pontecorvo, R. Shay, and A. Hart, New York, Rinehart and Winston, Inc., p.43.

Stiglitz, J.E. 1994. "The Role of the State in Financial markets", *Proceedings of the World Bank Annual Conference on Development Economics*, 1994, IBRD pp 19-56.

The World Bank. 1989. *World Development Report,* New York, Oxford University Press.

_____. 1993. *The East Asian Miracle,* New York, Oxford University Press, 1993, p. 358.

Zephrin, Mary. 1993. "Financial Liberalisation: A Theoretical Perspective", *Money Affairs,* Centre for Latin American Monetary Studies, Vol. VI, No. 2, July-December, 1993, pp. 1-26.

Section B:
Financing Growth in the Caribbean

6

The International Community and the Caribbean Potential Paths to Achieving Stability in Development Finance

Anston Rambarran &
*Kevin Finch**

Abstract

This paper discusses the role of international financial assistance in Caribbean economic development, with the view of devising appropriate strategies for the future. The authors focus primarily on the smaller more vulnerable countries of the region, since in their view these economies have limited access to international capital markets and fewer growth prospects. The main findings are that future financial flows could be determined by the interaction between regional countries and the International Monetary Fund (IMF). Indeed, the Poverty Reduction Growth Fund-supported programme could be a possible avenue for securing financial assistance for those regional countries facing severe structural constraints, although some of the criteria exclude several Caribbean countries. In this regard, using certain vulnerability criteria could provide access to concessional finance from the IMF and World Bank for those Caribbean countries with per capita above the current IDA limit of US$875. Furthermore, the complexity of the developmental challenges to be faced by regional countries, particularly in meeting the Millennium Development Goals, requires additional assistance from other key international development institutions to advance the reform process.

---

* The authors are economists in the Research Department of the Central Bank of Trinidad and Tobago. The views expressed are those of the authors and not necessarily those of the Central Bank. We would like to thank Esteban Perez, Ronald Ramkissoon, DeLisle Worrell and Ratna Sahay for their comments on an earlier draft, which was presented at the 35th Annual Conference of the Caribbean Centre for Monetary Studies, St, Kitts, November 24-28, 2003. We alone are responsible for any remaining errors.

Introduction

Over the past few decades, most Caribbean countries have achieved considerable social, economic and political progress, but have entered the new millennium confronted by challenges that threaten their future development. On the external front, regional economies are grappling with multiple external shocks for which many have not been well-prepared. Most of these shocks are permanent - reduced concessional aid, the dismantling of preferential trade arrangements for sugar and bananas, and interventions related to drug trafficking, money laundering, terrorism financing and the supply of cross-border services. In particular, the negative impacts of the events of September 11th, 2001 and the Iraq war temporarily worsened macroeconomic conditions in the region's tourism-based economies.

In terms of domestic circumstances, there are escalating unemployment and under-employment, substantial poverty, and a high and rising incidence of HIV/AIDS. Also, marked recurrences of hurricanes, tropical storms and floods in recent years have disrupted key productive activities, imposing disproportionate economic and social costs. Moreover, Caribbean countries share many of the vulnerabilities of small states – highly open economies with typically limited production and export bases – which magnify the severity of these threats.

Some Caribbean countries have begun to respond to these events while others have delayed taking the politically costly adjustment option by accessing new borrowings. The overall economic outlook for the region appears hopeful rather than comforting (Bourne, 2003). The state of affairs in the Organisation of Eastern Caribbean States (OECS), however, seems precarious. Several members face high debt burdens and limited growth prospects, which could possibly, if left unchecked, put at risk the viability of the long-standing currency board arrangement. The gravity of the situation serves as a wake-up call to all CARICOM economies concerning the urgency to articulate specific strategies for survival in a rapidly evolving hemispheric and global environment. The countries of the OECS have already begun to design "home-grown" stabilisation programmes. Indeed, the establishment of a Regional Stabilisation Fund (RSF) is expected to help countries deal with short-term balance of payments problems or fiscal imbalances and to supplement resources from the multilateral financial institutions.

The future development of Caribbean states is primarily their responsibility. However, at both the United Nations-organised Monterrey Financing for Development conference and the Johannesburg World Summit on Sustainable Development, the international community committed to providing multi-faceted assistance for social development and the eradication of global poverty. Indeed, developing countries are not expected to go it alone, as building a "global

partnership for development" is one of the eight ambitious develop-ment targets embodied in the Millennium Development Goals (MDGs). [1]

The Caribbean is clearly at a historical juncture and needs enhanced support from the international lender/donor community, especially if the region is to at least stand a fair chance of achieving the MDGs. This support should not only ensure an appropriate mix of adjustment and financing, but should provide breathing space for the design of a more comprehensive medium-term solution, as many of the region's economic problems are structural. In keeping with its commitment under the Monterrey Consensus, the region is expected to support these initiatives through the pursuit of sound economic policies and good governance.

Accordingly, this paper examines the contribution of the international community towards the supporting and financing of Caribbean development, identifying possible engagement strategies for the future. Particular attention is paid to the smaller regional economies, whose access to international capital markets is limited and whose economic prospects are dismal. The study draws from Lane (2003), who reviews the support of the international community to the transitional challenge facing the seven poorest and most heavily-indebted members of the Commonwealth of Independent States (CIS-7).

The rest of the paper is structured as follows. Section 2 reviews the trends in external financing flows to Caribbean countries over the period 1990-2001. Section 3 describes the more recent engagement of the international financial institutions in the Caribbean, focusing on the International Monetary Fund (IMF), which is supposed to serve as a "gatekeeper" in catalysing other financial flows. Section 4 provides a discussion of the recent initiatives to reform the international financial institutions before addressing their potential future role in the region in Section 5. Concluding remarks are made in Section 6.

Trends in External Financing Flows to the Caribbean: 1990-2001

Net resource flows to the Caribbean amounted to around US$3,690 million in 2001, a more than fourfold increase since the start of the 1990s (Table 1). However, this aggregate picture masks both a dramatic change in the composition of external financial flows and an extremely skewed distribution in favour of a few countries. An expansion in private capital has occurred simultaneously with reduced access to concessionary financing, as aid donors have been re-ordering

---

1 The United Nations Declaration on September 8, 2000 embodies a commitment by the 189 United Nations member states to achieve eight ambitious Millennium Development Goals (MDGs) by 2015, each of them accompanied by specific targets and indicators. The eight goals are (i) to halve the proportion of people living in extreme poverty and hunger; (ii) to achieve universal primary education; (iii) to promote gender equality and empower women; (iv) to achieve a two-thirds decline in infant mortality; (v) to achieve a three-fourths decline in maternal mortality; (vi) to halt and reverse the spread of HIV/AIDS, malaria and other diseases; (vii) to ensure environmental sustainability; and (viii) to develop a global partnership for development.

Table 1
Caricom Net Financing Flows, 1990 – 2001

Type of Financing Flows (US$ million)	1990*	1995	1996	1997	1998	1999	2000	2001
Total Net Resource Flows	**882**	**1,866**	**1,270**	**3,223**	**3,166**	**2,998**	**3,233**	**3,689**
Total Net Long-Term Resource Flows	910	1,781	1,747	2,462	3,324	2,720	3,054	3,582
Official Development Finance	**701**	**1,032**	**537**	**410**	**585**	**438**	**530**	**523**
Grants (including technical assistance)	433	953	489	424	521	392	382	421
Loans	269	79	48	(14)	65	46	147	102
Bilateral	106	(145)	(229)	(276)	(164)	(180)	(159)	(131)
Concessional	126	(3)	(16)	(66)	(53)	(89)	(59)	(59)
Multilateral	163	207	247	162	192	223	367	292
Concessional	140	112	176	116	133	107	115	62
Total Private Flows	**209**	**749**	**1,210**	**2,052**	**2,739**	**2,281**	**2,525**	**3,059**
Debt Flows	(202)	(123)	211	195	419	150	962	1,069
Commercial bank loans	(70)	(126)	(53)	(35)	(49)	(94)	138	28
Bonds	(97)	48	172	46	227	165	873	966
Other	(34)	(45)	92	183	241	79	(48)	75
Foreign Direct Investment (net)	411	855	999	1,858	2,320	2,131	1,562	1,990
Portfolio Equity Flows	n.a.	17	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Short-Term Net Debt Flows	**162**	**278**	**(290)**	**738**	**(151)**	**459**	**19**	**294**
Memorandum items:								
Total Net Transfers	(467)	(491)	(911)	(20)	(487)	(29)	319	658
Workers' remittances, received	354	735	796	837	893	884	1,002	1,169

Source: Global Development Finance 2003; IMF Article IV Consultations
Notes: * Suriname, Antigua and Bahamas are omitted because of data unavailability.
n.a. means not available.

their priorities away from regional economies towards poorer countries in Eastern Europe and Sub-Saharan Africa. Private capital flows to the region accounted for more than 80 percent of the total resource flows in 2001, up from about 25 percent in 1990. In particular, foreign direct investment (FDI) has grown remarkably (385 percent), becoming the single largest source of stable financing, but with a distribution highly concentrated in Trinidad and Tobago and Jamaica. Together, these countries received nearly 60 percent of the total US$5,684 million invested in the region in the ten-year period 1991-2001. This reflects, to some extent, the stage of financial liberalisation and the privatisation thrust of these two countries. Excluding FDI, aggregate net resource flows to Caribbean countries totalled US$1,699 million in 2001, only twice the level recorded in 1990 and quite minimal on a per capita basis.

Official development finance (including grants) amounted to US$523 million in 2001, a sharp decline from the peak of US$1,032 million in 1995 and from the US$701 million received in 1990. Net bilateral lending to the region turned negative from the mid-1990s, indicating that Caribbean countries repaid more to industrial countries than they borrowed. However, because of offsetting, albeit falling, grant resources, the region has been able to continue registering positive net aid inflows, but these are modest, at least in per capita terms. Excluding grants, net lending from official sources has remained weak, as have net non-concessional flows from multilaterals.

From 1995 to 1999, new commercial bank loans to countries in the Caribbean were less than the amount of maturing debt, resulting in higher net repayments. Faced with dwindling official loans, many governments have increasingly resorted to private lending. On a net basis, bank loans to and bond issues by the region amounted to US$994 million in 2001, almost the same level as in the previous year. Many CARICOM economies are raising substantial amounts of capital in Trinidad and Tobago to bridge their funding gaps and/or refinance debt.

Flows of short-term debt have for the most part displayed a rising trend, peaking at around US$740 million in 1997, about 4 ½ times the level of 1990. Portfolio flows into the region were negligible. Although recognised as a legitimate source of financing, these flows are less stable. The symbiotic relationship between financial crises and volatility of portfolio flows has been well documented, especially in the case of the Asian Crisis. While the public external debt-to-GDP ratio of the region has been fairly stable, averaging between 50 and 60 percent, the external debt-to-GDP ratio for the OECS has been growing, from 39 percent in 1996 to 49 percent in 2001 (Tables 2-4).

Total net transfers improved early into the new millennium, averaging a positive balance of US$488 million in 2000-2001 relative to an average annual outflow of US$388 million in the last five years. Remittances have also constituted an important and growing source of external financing to Caribbean countries, particularly Jamaica, Haiti and Dominica. In the period 1997-2000, total workers' remittances averaged US$957 million, about double the level of official aid-related inflows. The United States remains the largest source of remittances for the region, but heightened security concerns and a soft labour market could probably limit these flows over the next few years.

Table 2
CARICOM Total External Debt Stock: 1990 – 2001
(US$ millions)

Country	1990	1995	1996	1997	1998	1999	2000	2001
CARICOM	**11,625**	**11,961**	**10,843**	**10,947**	**10,979**	**11,476**	**12,227**	**13,420**
Bahamas	n/a	91	77	94	90	107	115	121
Barbados	683	474	435	399	388	444	548	701
Belize	154	255	282	450	334	392	607	708
Guyana	1,969	2,129	1,654	1,635	1,516	1,478	1,431	1,406
Haiti	911	816	904	1,052	1,050	1,182	1,169	1,250
Jamaica	4,667	4,257	3,982	3,910	4,014	3,910	4,270	4,956
Suriname	n/a	211	217	158	212	258	244	321
Trinidad & Tobago	2,511	2,746	2,248	2,166	2,174	2,462	2,450	2,422
OECS	**730**	**982**	**1,045**	**1,083**	**1,203**	**1,244**	**1,394**	**1,535**
Antigua & Barbuda	346	444	456	467	453	453	465	492
Dominica	88	107	119	107	116	116	163	207
Grenada	111	127	141	123	179	143	179	215
St. Kitts & Nevis	45	57	65	114	128	138	155	189
St. Lucia	79	128	142	153	190	199	237	238
St. Vincent & the Grenadines	61	119	123	118	137	194	196	194

Sources: Global Development Finance 2003; IMF Article IV Consultations 2002;
Central Bank of Bahamas *Quarterly Economic Review* - June 2000.

Table 3
Caricom Total External Debt Stock, 1990 – 2001
(In percent of GDP)

	1990	1995	1996	1997	1998	1999	2000	2001
CARICOM	**109.0**	**67.8**	**53.7**	**51.7**	**51.4**	**53.7**	**57.7**	**62.6**
Bahamas	n/a	8.7	8.1	8.4	8.3	8.0	7.5	7.1
Barbados	27.5	22.1	24.4	15.7	15.6	17.2	21.2	27.5
Belize	37.9	30.3	34.9	36.4	38.9	51.5	70.6	79.5
Guyana	607.1	308.0	202.3	195.7	187.3	178.2	167.8	171.1
Haiti	n/a	n/a	30.6	30.0	29.0	26.4	29.9	35.2
Jamaica	116.2	68.6	50.8	45.4	43.4	42.8	48.3	52.3
Suriname	n/a	28.8	22.1	20.1	20.0	29.5	28.2	42.8
Trinidad and Tobago	60.9	35.0	31.3	26.1	25.1	26.4	23.3	20.6
OECS	**48.1**	**42.8**	**38.8**	**39.5**	**40.8**	**44.2**	**49.2**	**54.9**
Antigua & Barbuda	82.2	83.0	84.1	81.2	73.1	69.6	69.9	70.5
Dominica	52.5	44.1	41.7	35.0	35.1	48.4	54.0	64.8
Grenada	n/a	30.6	26.3	25.7	27.2	26.2	25.3	40.4
St. Kitts & Nevis	26.4	n/a	25.4	39.6	43.4	50.3	49.2	59.0
St. Lucia	n/a	22.8	24.8	25.4	22.6	24.2	27.6	30.9
St. Vincent & the Grenadines	31.4	33.5	30.2	30.0	31.6	48.4	48.0	49.8

Source: IMF Article IV Consultations 2002; ECCU - Update on Regional Developments 2003.

Table 4
Caricom Total External Debt Stock, 1990 – 2001
(In percent of Exports)

Country	1990	1995	1996	1997	1998	1999	2000	2001
CARICOM	**174.9**	**111.4**	**98.3**	**102.7**	**91.4**	**88.6**	**97.4**	**112.9**
Bahamas	n/a	n/a	**6.9**	**9.5**	3.3	2.9	2.3	2.7
Barbados	73.5	39.4	33.0	29.3	27.3	30.8	35.8	51.8
Belize	57.2	81.2	85.7	126.3	94.5	98.3	147.6	182.3
Guyana	951.0	331.9	225.6	219.3	201.2	182.1	174.4	180.2
Haiti	n/a	311.4	323.7	332.7	224.6	203.4	221.3	238.4
Jamaica	189.6	103.3	97.1	93.3	95.6	90.4	93.4	109.8
Suriname	n/a	49.7	58.4	25.2	36.4	47.3	43.4	51.5
Trinidad and Tobago	107.7	65.9	65.9	65.9	50.9	47.1	35.2	34.3
OECS	**74.1**	**82.4**	**84.6**	**92.7**	**91.1**	**89.3**	**100.6**	**119.5**
Antigua and Barbuda	142.7	140.5	141.9	199.1	152.7	151.9	152.8	170.9
Dominica	85.5	93.1	95.0	75.9	74.3	72.1	109.1	166.8
Grenada	105.0	99.0	103.4	85.7	105.1	62.9	74.2	77.0
St. Kitts and Nevis	44.0	45.3	49.9	76.2	82.7	91.4	98.6	123.7
St. Lucia	26.3	31.3	37.3	40.0	46.5	48.9	60.9	68.4
St. Vincent and the Grenadines	41.0	85.0	80.4	79.2	85.0	108.9	108.0	109.9

Source: IMF Article IV Consultations 2002; Global Development Finance 2003.

The pattern of capital flows for individual countries differs substantially from the aggregate picture for the region, particularly for the OECS countries. External current account deficits in St. Lucia and St. Vincent and the Grenadines have been sufficiently covered by capital inflows, including public sector borrowing, mainly on concessional terms. However, the rising cost of short-term commercial debt in St. Lucia recently led to refinancing arrangements. The private sector in these islands had also received substantial FDI to mainly finance the construction of hotels. Although the Government of St. Kitts has been able to maintain access to external financing on reasonable terms, the public debt stock has risen considerably over the last five years, putting pressure on the country's repayment capacity.

The other OECS countries and Belize have fared worse. Governments in Belize, Dominica, and Grenada have resorted to non-concessional borrowing, and are typically repaying more in principal than they are receiving in new loans. Grants are helping to keep total capital flows positive. Moreover, FDI in these three countries has usually been lower than the other OECS countries. With the exception of St. Kitts, FDI to the OECS has been steadily declining. Even with an IMF-supported programme, Dominica still faces a large external financing gap over the medium term, which is expected to be covered by comprehensive debt restructuring. In Belize,[2] the level of public external debt (concentrated in commercial borrowing) and its maturity profile pose a serious threat to the viability of the balance of payments. Grenada, which has contracted debt both intra-regionally and on the international capital market, is seeking to avoid a rapid debt build-up.

In Antigua and Barbuda, the Government has received non-transparent offshore financing and has been accumulating substantial arrears. External arrears are mainly to bilateral official creditors and commercial banks, so actual credit flows are about zero. In addition, accruals of additional debt for unpaid interest far exceed the small flow of grants and inward direct foreign investment.

In Guyana, debt relief under the original Heavily Indebted Poor Country (HIPC) Initiative and interim assistance from the enhanced HIPC Initiative are helping to cover high current account deficits. Since 1996, the Paris Club bilateral creditors, including Trinidad and Tobago, have been providing Guyana with debt relief. Bilateral creditors will provide further relief under the enhanced HIPC Initiative when Guyana reaches its floating completion point, sometime in 2004.[3]

---

2 Interestingly, Belize was the first country in Central America and the Caribbean to issue a Eurobond with a "collective action clause", which represents a contractual approach to debt restructuring, making it easier for creditors to renegotiate sovereign debt contracts should borrowers default. Belize issued a 12-year US$100 million bond at an interest rate of 9.75 percent.

3 To date, Trinidad and Tobago has contributed US$367 million in debt relief to Guyana under the HIPC Initiative. Multilateral creditors have, for the most part, delivered their share of debt relief to Guyana. The Caricom Multilateral Clearing Facility (CMCF) is still exploring the possible modalities of delivering its share of enhanced HIPC assistance to Guyana, about 9 percent of total debt relief.

Haiti, the poorest country in the Western Hemisphere, has experienced political instability over the last six years. Donors have been channelling the minimum quantum of grants needed for humanitarian assistance through NGOs, but have suspended budgetary aid pending the resolution of the political crisis. FDI is almost nonexistent. Remittances account for the majority of foreign exchange. In 2000, Haiti started to accumulate external arrears of which about half were to the World Bank and Inter-American Development Bank (IDB). Haiti is now attempting to establish a track record through an IMF Staff-Monitored Programme (SMP), which could lay the basis for an IMF-supported programme. Hopefully, the clearance of arrears will help to initiate a long overdue re-engagement of the international donor community with Haiti.

Positive flows of official aid and grants to Suriname from the Netherlands virtually ceased during 1997-2000, as relations with the Dutch authorities deteriorated over growing fiscal indiscipline. Private capital flows to the bauxite and alumina sector also declined. Commercial borrowing, mainly short-term commercial debt at high interest rates, placed additional pressure on already dwindling reserves. Following a strengthening of the macroeconomic policy stance, Suriname obtained in 2002 a Dutch government-guaranteed loan, which helped to reconstitute its reserves, but its financing position remains difficult.

For Jamaica, net external flows fell in the 1990s, worsening the consequences of its financial crisis. Lending to the public sector became more negative, as Paris Club rescheduling and multilateral support from the IMF and World Bank ended around the end of 1995. Financing the external current account deficit remains heavily dependent on FDI, and remittances, which are large and at times create problems for short-term macroeconomic management. Nevertheless, the debt dynamics in Jamaica are very vulnerable to natural disasters and an adverse international environment. Jamaica has a speculative grade credit rating on its external debt.

Trinidad and Tobago received small net flows of official loans and grants in the 1990s. The flows to the private sector have surged, however, led by foreign direct investment to the oil and gas sector. The Government re-entered the international capital in 1992, after a five-year absence during which the external debt was successfully rescheduled. Trinidad and Tobago has an investment grade rating. Even though the external debt stock is manageable, a rising domestic debt stock has been of some concern.

In Barbados, there are robust flows to the private sector and modest net flows to the public sector because the country is repaying past public borrowing and receiving little in grants. Nevertheless, countercyclical macroeconomic policy over the last few years has led to higher fiscal deficits and an increasing debt burden, which are a source of unease, even though Barbados has an investment grade rating.

Large foreign direct investment flows into the tourism, financial and real estate sectors in The Bahamas helped to finance external current account deficits from the second half of the 1990s. With unsettled global financial markets, FDI flows have slowed. Short-term external debt is minimal. The Bahamas also has an investment grade credit rating.

In summary, many regional economies have adjusted to the restricted official flows of the 1990s through increased external borrowing, which is straining limited

fiscal resources, especially in the OECS. The region as a whole needs to make progress in containing rising debt burdens, regaining fiscal stability and exploring alternative sources of financial and other support from the international community.

The International Financial Institutions and the Caribbean

The international financial institutions provide three kinds of assistance: (i) policy advice; (ii) technical assistance; and (iii) financial support.

Policy Advice

The IMF provides advice on macroeconomic stabilisation, monetary and financial system issues, exchange rate policy and fiscal affairs. In addition to advice on individual projects and sectoral issues, the World Bank advises on the structural and social agenda, including institutional and environmental aspects of development.

In general, the policy advice from these two international institutions is reflected in the annual Article IV consultations conducted by the IMF and in the Country Assessment Strategy (CAS) prepared by the World Bank. These reports also influence the conditions attached to loan and assistance agreements negotiated with the individual countries. In addition, the policy advice offered by the IMF and the World Bank is now integrated into the Poverty Reduction Strategy Paper (PRSP) process, which is country-led and participatory.

Article IV consultations in most Caribbean countries are undertaken annually and focus largely on issues related to macroeconomic and financial sector stability. More recently, Article IV discussions for individual members of the OECS have been supplemented by a regional surveillance approach. The surveillance report is perhaps the most comprehensive source of information on the OECS, as it provides a critical analysis of the economic outlook, discussion of risks and vulnerabilities, and possible strategies going forward for the sub-regional grouping. A CAS, on the other hand, is usually undertaken over periods ranging from two to five years, as it involves collaboration with government and other stakeholders in formulating development strategies. At present, the World Bank has an operational CAS with the OECS and Jamaica.

An examination of the recommendations contained in these reports not surprisingly reflects the review of the "Washington Consensus" about the direction of the policy reforms for Caribbean countries. In addition to pursuing macroeconomic stability, typical elements of reform include price and trade liberalisation, privatisation of enterprises, the provision of basic infrastructure, the establishment of an investment- friendly business environment, and the implementation of codes and standards and regulatory structures. Of course, even with general acceptance of the desirability of all these elements, there is still plenty of room for debate about the appropriate pace and sequencing of policy measures. There is also the challenge to ensure a consistent and streamlined framework for the coordination of policy advice between the IMF and the World Bank.

It is problematic, however, to evaluate the quality of policy advice from the international financial institutions. First, Caribbean states are sovereign nations. They are, therefore, free to disregard, accept or partially implement external policy prescriptions, so that economic outcomes, which are influenced by various factors, cannot be closely linked to the policy advice given. Second, it is well understood that country reports by these international institutions do not reveal the full dynamic process of interaction between staff members and the national authorities in policy formulation. There is often a series of informal interventions and several iterations of discussions on policies desired by both staff and the authorities, so that the final published document reflects a compromise between the two parties.

Turning to the policy record of the Caribbean, it seems that first generation reforms initially helped to improve fiscal management and economic governance in most regional economies, but largely ignored the social dimensions of adjustment. CCMS et al. (1997) state that first generation adjustment efforts failed to prepare CARICOM for the imperatives of "strategic integration" with the international economy. However, it is also the case that for many Caribbean countries policy implementation was far from complete, reflecting varying degrees of capacity, commitment and response. Arguably, policy mistakes have been a major contributory factor to the debt overhang in several regional economies.

At a more challenging level, it could also be argued that the international financial institutions should have done more to become familiar beforehand with the regional economic environment, distinguishing the peculiarities of small states. There should have been better efforts at understanding the political and institutional obstacles to rapid reform, so as to help design gradualist strategies that cumulatively build a reform momentum. The IMF has apparently recognised the importance of achieving a critical mass of support for programmes and now promotes country ownership, though some could sceptically argue that this merely amounts to passing the buck directly to the national authorities. Aside from the difficulty of correctly selecting such strategies in real time and without the benefit of hindsight, it raises the fundamental issue of the international financial institutions infringing on a country's sovereignty by insisting on a specific policy design.

Regional authorities would do well to remember that the IMF's policy surveillance framework also provides a platform for dialogue. This is especially relevant in the area of trade, which has perhaps the best prospects for boosting growth and reducing poverty in developing countries. The region must insist that the IMF step up surveillance in countries whose trade policies are of fundamental importance for the world trading system, with a focus on increasing market access for developing country exports, including those from the Caribbean. It is also desirable for the IMF to direct more attention to the reform of policies and arrangements in the major industrial countries, where changes in interest and exchange rates have tremendous consequences for the rest of the world, including the Caribbean. This is, of course, related to the call for enhancing the voice, participation and influence in the decision-making of developing countries at the IMF and the World Bank.

Technical Assistance

The international financial institutions devote substantial resources to providing technical assistance to member countries through staff-led missions, assignment of short-term experts and long-term resident advisors, as well as seminars and workshops. Table 5 lists the number and sectoral distribution of technical assistance missions from the IMF to Caribbean countries in recent years. As befits its core areas of expertise, these missions and placement of experts have primarily provided technical advice on macroeconomic and financial statistics, monetary and exchange affairs, and fiscal processes. The IMF is also carrying out related diagnostic activities, such as Reports on Observance of Standards and Codes (ROSCs) and Financial Sector Assessment Programmes (FSAPs).

Regional arrangements for technical assistance delivery and training are assuming greater prominence. They are more cost-effective, promote ownership and enhance cooperation with other technical assistance providers. In November 2001, the IMF established the Caribbean Regional Technical Assistance Centre (CARTAC), in collaboration with the Canadian International Development Agency (CIDA), the United Nations Development Fund (UNDP) and other donor agencies, to enhance the region's capacities in macroeconomic management. Over its first year of operations, CARTAC has been very active, undertaking technical assistance missions, conducting training courses/workshops, and providing specialised consultancies, and was even instrumental in the formation of the Caribbean Public Finance Association.

Going forward, CARTAC will be engaged in providing technical assistance towards fiscal and economic policy reforms in the Eastern Caribbean through the Stabilisation and Technical Assistance Programme (SATAP) and the ECCU Fiscal Machinery Initiative. Clearly, CARTAC's scope of work has expanded well beyond initial expectations and demonstrates the benefits of greater local participation. However, prioritisation and costing remain major issues in light of competing resource and logistical demands. The Caribbean is simultaneously involved in three trade negotiations - the Free Trade Area of the Americas (FTAA), Caricom Single Market and Economy (CSME) and the Cotonoú Agreement. IMF technical assistance to help navigate the dire straits of trade negotiations would go a long way in building capacity in such a crucial area.

Financial Support

Table 6 provides details on the financial relations between the Caribbean and the IMF, which had a fairly active programme relationship with the region in the 1980s. Given the conjunction of the debt crisis and global recession, many countries resorted to Stand-By Arrangements as a source of balance of payments support. Indeed, Jamaica was under a series of IMF-supported programmes and became a prolonged user of Fund resources. Guyana made intensive use of the concessional lending facility, the Enhanced Structural Adjustment Facility (ESAF), known since 1999 as the Poverty Reduction and Growth Facility (PRGF). For Dominica and Grenada, the Extended Fund Facility (EFF) was an additional source of financing.

Table 5
IMF Technical Assistance To Caricom Countries
(Number of Programmes)

Country	Fiscal Affairs Division	Monetary and Exchange	Statistics	Legal	Informa-tion Technology	CARTAC	Period
Antigua & Barbuda	2		2				1993-2001
Bahamas	2	2	1			4	2001-Present
Barbados	5	2	2			1	1989-2002
Dominica	3						1995-1999
Grenada	1	2		1			1999-2001
Guyana	3	18	3				1996-2002
Haiti	1	1	1	1	1		1995-2000
Jamaica		1	1				1995-1998
St. Kitts & Nevis	1	1					2000-2002
St. Lucia	2					1	1998-2002
St. Vincent & the Grenadines		1	2			1	2001-Present
Suriname	1	2	2				1997-2001
Trinidad & Tobago	2	4	1				1997-2003
Total	**23**	**34**	**15**	**2**	**1**	**7**	

Source: IMF Article IV Consultations Reports 2001-2003.

Table 6
Caribbean Countries Lending Arrangements With The IMF, 1980 - 2002

Country	Facility	Arranged	Expired/ Cancelled	Agreed (SDR Million)	Drawn (SDR Million)	Outstanding (SDR Million)
Antigua & Barbuda	-	-	-	-	-	-
Bahamas	-	-	-	-	-	-
Dominica	SAF	11/26/1986	11/25/1989	2.8	2.8	-
	SBA	07/18/1984	07/17/1985	1.4	1.0	
	EFF	02/06/1981	02/05/1984	8.6	8.6	
Grenada	EFF	08/24/1983	01/23/1984	13.5	1.1	-
	SBA	05/11/1981	05/10/1982	3.4	2.9	-
	SBA	11/06/1979	12/31/1980	0.7	0.7	-
Haiti	ESAF	10/18/1996	10/17/1999	91.1	15.2	15.2
	SBA	03/08/1995	03/07/1996	20.0	16.4	-
	SBA	09/18/1989	12/31/1990	21.0	15.0	-
St. Lucia	-	-	-	-	-	-
St. Kitts and Nevis	-	-	-	-	-	-
St. Vincent	-	-	-	-	-	-
Suriname	-	-	-	-	-	-
Barbados	SBA	02/07/1992	05/31/1993	23.9	14.7	-
	SBA	10/01/1982	05/31/1984	31.9	31.9	-
Guyana	PRGF	09/13/2002		54.6		
	ESAF/PRGF	07/15/1998	12/31/2001	53.8	24.9	71.4
	ESAF	07/20/1994	04/17/1998	53.8	53.8	-
	ESAF	07/13/1990	12/20/1993	81.5	81.5	-
Jamaica	EFF	12/11/1992	03/16/1996	109.1	86.8	24.6
	SBA	06/28/1991	09/30/1992	43.7	43.7	-
	SBA	03/23/1990	05/31/1991	82.0	82.0	-
Trinidad and Tobago	SBA	04/20/1990	03/31/1991	85.0	85.0	-
	SBA	01/13/1989	02/28/1990	99.0	99.0	-

Source: IMF Article IV Consultations Reports 2002.
Notes: ESAF – Enhanced Structural Adjustment Facility; SAF – Structural Adjustment Facility; PRGF – Poverty Reduction and Growth Facility; EFF- Extended Fund Facility; SBA – Standby Arrangement

At present, the IMF has a limited presence in the region, with programmes in Guyana and, more recently, Dominica, which cancelled its Stand-By Arrangement and is moving ahead with a three-year PRGF-supported programme. Haiti has a SMP that does not entail access to IMF resources and is attempting to build a satisfactory record of performance so as to engage the IMF in a programme relationship, possibly through a PRGF arrangement.

Over the last four decades, the Caribbean, especially in Jamaica, The Bahamas, and some countries in the OECS, has faced numerous natural disasters (hurricanes, floods and earthquakes). There were 16 natural disasters in the region in the 1960s, 13 in the 1970s, 41 in the 1980s, 48 in the 1990s and 13 already for the first three years of the current decade (Bourne, 2003). Although the IMF lends for emergency assistance in the event of natural disasters, this facility has had limited attractiveness for Caribbean countries because of low access, lack of concessionality and delays in response. Instead, as Table 7 shows, most of the financing for disaster and economic recovery has come from the World Bank. However, the lead time between the shock and provision of assistance from the Bank has often been too long. Caribbean countries, therefore, have had to initially fund reconstruction efforts, to the detriment of their fiscal accounts. The creation of quick-disbursing instruments would help to address the impact of natural disasters and other shocks that frequently hit the region. Moreover, the international community should seriously consider the establishment of a global fund for natural disasters which are becoming more frequent and more destructive.

In summary, this section has reviewed some elements of the involvement of the IMF and World Bank in the Caribbean. These institutions are playing a rather active role in supporting regional economies through policy advice and technical assistance. Financial support is, however, limited. Although policy errors have occurred, on balance it would be difficult to entirely dispel the claim that the region would have performed better without the interventions of these institutions. The Caribbean still needs to make further strides along its development path and, in this context, it is appropriate to ask more from the international financial institutions in terms of finding new ways to assist in this quest.

The Evolving Role of the International Financial Institutions

Since the East Asian financial crisis of 1997/98, numerous proposals have been put forward to reform the international financial institutions. The G-7 Finance Ministers have done reviews at summits in Halifax (1995), Cologne (1999), Okinawa (2000) and Rome (2001). The US Congress established an International Financial Institution Advisory Commission (known as the "Meltzer Commission") whose majority report recommended drastically shrinking the scope of IMF intervention and the role of the World Bank in development finance. A minority report of the Commission, however, called for more limited reform and a larger global role for both institutions. The developing countries were of the firm view that the IMF should maintain a role in all member countries, including in the poverty reduction area (Mohammed, 2001). The IMF and the World Bank have also responded to these concerns, initiating major changes in their organisational and operational structures, especially in assisting low-income countries.

Table 7
Sectoral Composition of World Bank Lending to the Caribbean
(Percent of Total Lending, 1995-2002)

COUNTRY	LAW	IND	AG	EM	TRAN	FIN	WSF	HSS	ED	IC	DER
Bahamas	-	-	-	-	-	-	-	-	-	-	-
Dominica	-	-	-	-	-	-	-	-	-	16	84
Grenada	-	-	-	-	-	-	-	-	-	8	92
Haiti	-	4	7	12	11	-	9	39	-	-	18
St. Kitts & Nevis	-	-	-	-	-	-	-	-	-	-	-
St. Lucia	-	-	-	-	-	-	20	8	34	3	35
St. Vincent & the Grenadines	-	-	-	-	-	-	-	-	-	12	88
Suriname	-	-	-	-	-	-	-	-	-	-	-
Barbados	-	-	-	-	-	-	-	-	-	-	-
Jamaica	34	-	-	-	-	-	-	66	-	-	-
Guyana	-	-	-	-	-	12	44	-	44	-	-
Trinidad &Tobago	23	-	-	-	-	-	-	-	77	-	-

Source: IMF Article IV Consultations Reports 2002.
Notes: LAW – 'law and public administration'; IND – 'industry & trade'; AG – 'agriculture'; EM – 'energy & mining'; TRAN – 'transport'; FIN- 'finance'; WSF – 'water, sanitation, flood recovery'; HSS 'health and social services'; ED – 'Education'; IC – 'information and communication'; DER – 'disaster and economic recovery'.

The 1998 World Bank report *Assessing Aid* provided a refreshingly frank evaluation of the failure of aid to improve macroeconomic performance in countries that maintained distorted policy regimes, whereas it confirmed that aid can work and has worked when it supports reforms that are key to growth and poverty reduction. Considerable political resonance in the wake of the Jubilee campaign, led by advocacy nongovernmental organisations, resulted in modifications to the HIPC Initiative in 1999. This brought deeper, broader and faster debt relief and an ambitious objective to provide a permanent exit from debt rescheduling for some of the world's heavily indebted poor countries.

A central principle in this new dispensation is that national development strategies are most successful if "owned" by domestic society. Without a doubt, there will always be differences between the international financial institutions and the authorities on the diagnosis of and solutions to economic problems. However, reforms that can garner a critical mass of support and commitment have the best chance of success. Such ownership is established by ensuring the widest possible participation of the political establishment, the social partners and civil society. In this process, the international community provides advice and technical support, and ensures that financial assistance programmes are consistent with the national development strategy.

This is the philosophy underlying the country-led PRSP process, which offers a workable framework for cooperation among the IMF, the World Bank and other development partners.[4] The PRSP feeds into an overall Comprehensive Development Framework process that attempts to provide a common foundation for implementing the advice and assistance coming from the World Bank's CAS, the IMF's PRGF, and the policy frameworks of the other multilateral development banks and the United Nations. In this way, the assistance and advice provided by the international community are expected to be better streamlined and integrated into a holistic long-term strategy.

Although it is difficult to argue against a holistic approach to understanding the development needs of each country, the particular involvement of the IMF in poverty reduction is troubling to some observers. The majority report of the Meltzer Commission wanted to eliminate the PRGF. Several academics and NGOs have similarly argued for taking the IMF out of the poverty reduction business, which is seen as an area outside its traditional mandate and core expertise. However, the IMF considers that by safeguarding macroeconomic and financial stability, it contributes in a major way to protecting the most vulnerable, to reducing poverty and to enhancing social justice – within countries and across the world (Larsen, 2003).

---

4 In 2002, the World Bank and the IMF concluded a review of the PRSP process, which included contributions from dozens of non-governmental organisations (NGOs). Although acknowledging that the process could be improved, the World Bank and the IMF also concluded that it worked fairly well. The endorsement from the NGOs, however, was less enthusiastic (Levisohn, 2003).

This may be perfectly consistent with the lending and policy surveillance activities of each agency remaining specialised. The IMF will largely advise on macroeconomic policies, whereas the World Bank and other multilateral development banks will be more involved in structural reform. However, it does raise legitimate concerns about the appropriate division of labour and the modalities of coordinating programmes and structural conditionalities, particularly between the IMF and the World Bank. Indeed, it is quite easy to see how this could lead to the perception, and perhaps the reality, that many members of these institutions are placed at the mercy of the arduous compulsions of a powerful alliance over whose decisions they have little, if any, influence.

Another element in the new dispensation is the strong insistence by the international financial institutions on reforms to help improve governance and reduce the opportunities for rent-seeking behaviour in borrower countries. Weak governance, it is argued, generally creates opportunities and incentives for corruption, which leads to a relatively skewed distri-bution of income and wealth, and negatively affects growth and living standards. Strengthening governance is now a recurring theme in programmes which the IMF and World Bank support as well as with bilateral donors. These conditions relate to the rule of law, judiciary reforms and civil society participation and represent an unwarranted invasion of national sovereignty (Kapur and Webb, 2000). The implication, however, is that a country which persists with weak governance structures may face suspension of financial support.

Striking the correct balance on this issue poses a major challenge for the international financial institutions. On the one hand, the withdrawal of support from a regime that fails to promote good governance must be seen as a credible threat. On the other, the multilaterals may opt to remain engaged with countries that persistently fail to deliver for geopolitical and other reasons. There is no easy solution to this problem. Based on the history of the relations between the international financial institutions and the Caribbean, it is not clear whether a suspension of financial support will indeed occur in the event of an egregious failure to fulfil governance commitments.

The reforms have also involved a new emphasis on transparency and public access to core economic data. Although not primarily designed with the Caribbean in mind, these countries have also been affected by the drive for greater openness. The websites of the IMF and, to a lesser extent, of the World Bank are providing more information about these countries' policies through country documents, policy papers and associated Public Information Notices (PINs). Since June 1999, most countries in the Caribbean have published their Article IV staff reports and PINs. In addition, a regional surveillance staff report on the OECS was published in March 2003.

The international financial institutions have also developed mechanisms for more accountability in their own activities. For instance, the IMF has established an Independent Evaluation Office (IEO), which operates independently of the management and at arm's length from the Executive Board. The IEO has completed

three evaluation reports,[5] whose findings have been endorsed by the Board with follow-up action taken by the management on several recommendations.

All these reform initiatives have strong applicability to member countries seeking greater engagement with the international financial institutions and have engendered much debate. Unfortunately, this debate has not brought a commensurate degree of clarity to the issues. Given the nature of the economic challenges facing the Caribbean, the region has to carefully consider how it further engages the international financial institutions, especially the IMF, whose seal of good-housekeeping is usually seen as imperative to catalysing other financial flows. At present, there appears to be civil neutrality in respect of policy advice (except for the programme countries) and promising signs of greater cooperation in technical assistance, particularly through CARTAC. It is, however, in the highly contentious area of financing reform programmes that regional economies, especially those with typically limited access to international capital markets and weak growth prospects, have to carefully craft their engagement strategies.

It is generally accepted that IMF financing should be temporary, so as to ease the burden of adjustment, while macroeconomic imbalances are being addressed (IMF, 2003a). In reality, however, there are many prolonged users who draw on IMF resources through successive arrangements. It is important to note also that, while the IMF has a role to play in support of growth and poverty reduction, it does not have the capacity or the mandate to provide long-term development assistance.

In the recent typology used by the Fund (IMF, 2003a), many of the smaller Caribbean countries might be classified as "early stabilisers", and some even exhibit various characteristics of "mature stabilisers". These features include a weak but growing, institutional capacity and tentative political support, and most important of all, macroeconomic stability is a dominant concern. In such cases, active financial involvement by the IMF can provide a measure of support to key government officials who are committed to reform, promote some degree of stabilisation, provide technical assistance and help mobilise more enduring donor support. However, the balance of payments need relative to Fund quota is normally great, and the programme usually faces potential risks such as shortfalls in financing, heightening social tensions and weak implementation capacity.

For such regional economies that need to re-establish growth by addressing the debt overhang and structural weaknesses, the PRGF-supported pro-grammes appear to be a good fit. Each country authority, however, must devise an appropriate strategy to engage the IMF and consider under what circumstances it makes sense to move from a relationship based mainly on Article IV surveillance and technical assistance to a programme relationship. One possible option to facilitate this transition might be to have a precautionary Stand-By Arrangement cancelled

---

5 The Independent Evaluation Office (IEO) of the IMF has completed the following three evaluation reports: (i) Prolonged Use of IMF Resources; (ii) Role of the IMF in Three Recent Capital Account Crises (Indonesia, Korea and Brazil); and (iii) Fiscal Adjustment in IMF-supported programmes. These reports have been made public, with a summary of the IMF Executive Board discussion.

and replaced by a PRGF arrangement, if a financing need arises. Another option might be progressively higher access PRGF-supported programmes. Of course, the converse also needs to be considered, that is, how to move from a financing relationship to other forms of assistance.

A major issue for Caribbean economies lies in the system used to determine eligibility for the use of PRGF resources. In practice, the IMF has relied on the level of per capita income and eligibility under IDA, as the determining criteria. The current cut-off point for IDA eligibility is a 2001 per capita GNP level of US$875. On this basis, only Dominica, Grenada, Haiti, St. Lucia, and St. Vincent and the Grenadines are PRGF-eligible. This automatically excludes from PRGF engagement several other Caribbean countries that face similar macroeconomic and structural problems. The use of a more relevant criterion than the usual GDP per capita limit would lead to the possible inclusion of countries like Antigua and Barbuda, Belize, St. Kitts and Nevis, and Suriname.

This issue of graduation is of considerable relevance to the small states of the Caribbean where a strong case can be made for using vulnerability criteria in determining access to concessional resources. It is notable that the IDA12 agreement (which covered the 3-year period ending June 2002) included a specific exception to the per capita income criterion for small island economies, maintaining a practice in effect since 1985. This exception continues in IDA13 (which covers the 3-year period ending June 2005). On this basis, there is no compelling reason why other Caribbean countries with GDP per capita limits higher than the current IDA cut-off point, but facing similar structural constraints, cannot be considered for access to concessional lending from both the IMF and World Bank.

The Future Role of the International Community in Assisting the Caribbean

The complexity of the development challenges facing Caribbean countries and in meeting the MDGs is such that the scope of required policy advice and technical assistance is far broader than can feasibly be provided by the World Bank and, especially, the IMF. Indeed, it is unlikely that these institutions have the competence or the flexibility to provide assistance on all aspects of the reform process. United Nations agencies such as the Food and Agriculture Organisation (FAO), the World Health Organisation (WHO), United Nations Conference on Trade and Development (UNCTAD) and the United Nations Children's Fund (UNICEF) potentially have much to offer in specific areas. NGOs can also help support development efforts in the Caribbean.

Within this context, there is an urgent need to augment existing financial resources,[6] as well as to develop new and innovative sources of assistance that

6 Since the declaration of the Millennium Development Goals, a number of attempts have been made to estimate the financing requirements for attaining these goals. The Zedillo Panel (United Nations, 2001) estimated conservatively that an additional US$50 billion would be required annually to achieve the international development goals. No official estimates have been made of the resources needed for the Caribbean to meet the MDGs.

do not create future debt sustainability problems. Several routes to raising additional external finance have been proposed over the years, but many are not politically feasible, amid a serious countervailing opposition and the requirement of an unprecedented degree of international cooperation and coordination.[7] Therefore, five promising options, which are of special relevance to the Caribbean, are discussed below. These proposals relate to (i) Official Development Assistance; (ii) The International Finance Facility; (iii) The HIPC Initiative; (iv) Multi-sectoral Global Funds; and (v) Remittances.

Official Development Assistance

Official development assistance (ODA) remains an important vehicle for financing development, but aid levels have been declining consistently over time. By 2000, ODA had fallen to 0.2 percent of the Gross National Income (GNI) of donor countries, well below the 0.7 percent target adopted by the UN General Assembly in 1970. Aid has also declined relative to economic activity in developing countries, from more than 5 percent in the early 1990s, to 3.4 percent in 2000. ODA flows from the top ten donor countries to the Caribbean amounted to just 7 percent of the total allocation in 2001.

Since then, new frontiers for aid seem to have opened up. At the Monterrey Conference on Financing for Development in March 2002, donor countries agreed to set more ambitious aid targets in making progress towards meeting the MDGs. The European Union has committed to raising its assistance to an average of 0.39 percent of GNI by 2006. The U.S. administration announced that it was increasing its bilateral assistance by US$10 billion over 2004-2006, placing these funds in a new Millennium Challenge Account. Funds will be allocated initially only to IDA-eligible countries showing a strong commitment to sound economic policies, good governance, and health and education. The U.S. administration has also pledged US$15 billion to a 5-year emergency plan for AIDS relief in Africa and the Caribbean. Other donors announced plans to raise aid levels. However, even if these pledges were realised, aid would still remain well below the peak of 0.34 percent of industrial countries' GNI achieved in the 1990s, but would provide an extra US$10 billion (World Bank, 2003).

It is important that donor countries strive to meet the aid targets set under the MDGs and to make already-promised bilateral ODA more coordinated, reliable and consistent. Halving the proportion of persons living in extreme poverty by 2015 could be achieved solely by at least doubling current world aid. However, this requires moving considerably beyond what has so far been promised. It also leads to concerns about the absorptive capacity associated with increased aid

---

7 Some of the more controversial proposals to raise additional external financing flows include (i) regular annual issues of Special Drawing Rights (SDRs) by the IMF; (ii) universal application of a withholding tax on portfolio income earned by non-residents; (iii) tapping private fortunes; and (iv) imposition of a tax on foreign currency transactions (Tobin Tax).

flows to developing countries, including those in the Caribbean, and whether these additional resources could be used efficiently and for their intended purposes.

Notwithstanding the new spirit for increasing aid levels, it is likely that *realpolitik* will remain a major force in aid relations, especially in the post September 11th world, where new global security concerns prevail. Burnell (2003) cautions that moral hazard could creep in where major donors seem to support countries with a strong case for responding to threats to their own security interests. An example in the region that best illustrates this is when in 2003 the US cut military aid to six Caribbean countries for failing to meet a July 1 deadline to grant immunity to US citizens from prosecutions before the new International Criminal Court (ICC) to deal with war crimes. By September 30, three countries had concluded the requisite agreement because US support was deemed essential to their counter narcotics and anti-terrorism operations.

International Finance Facility (IFF)

The gap between current ODA and the amounts needed to meet the MDGs has led to alternative proposals for development funding. In early 2003, the United Kingdom proposed an International Finance Facility (IFF) to leverage additional resources from the private capital markets. The IFF has been called a "modern Marshall Plan." Donors would make commitments to provide to the Facility a considerably larger annual flow of aid disbursements, averaging around US$50 billion, up until 2015. In turn, the Facility would issue bonds on the strength of these commitments and allocate funds through existing bilateral and multilateral institutions. These disbursements would provide the ODA element seen as necessary for meeting the MDGs by 2015, with a concentration on the targets of universal primary education, reducing child mortality, tackling HIV/AIDS and halving poverty (UK Treasury, 2003). Of relevance to the Caribbean is that disbursements under the IFF would, of course, be linked to appropriate policies on governance, trade and investment.

The IFF may provide a predictable and stable flow of aid over the medium term, but it appears unlikely that the Facility would come into existence exactly as proposed. Some donors may want to take part under different conditions. The channels for disbursing IFF resources also need to be more specifically defined. What can reasonably be expected is that the challenge for a target-based approach, with inter-donor coordination and mutual commitments far into the future, will come into fruition in some form.

The HIPC Initiative

The HIPC Initiative was first launched in 1996 by the IMF and the World Bank to reduce the public external debt burdens of some of the world's most heavily indebted poor countries to a level that would allow them to permanently exit the process of repeated debt rescheduling. Three years later and due to intense public pressure, the Initiative was enhanced to provide faster, deeper and broader debt relief, and linked HIPC debt relief to the preparation of a PRSP. Nevertheless, concerns persist that the enhanced HIPC Initiative is unlikely to

provide HIPCs with the assurance of long-term debt sustainability. Gunter (2003) contends that, even after the full adoption of the changes to address the six most crucial problems of the enhanced HIPC framework,[8] the debt sustainability of HIPCs would still remain fragile.

Of specific concern to the Caribbean is the manner used to determine HIPC eligibility and debt sustainability. The HIPC framework assumes that a country's external debt is sustainable if the NPV debt-to-export ratio is around 150 percent or the NPV debt-to-government revenue ratio is around 250 percent. However, the use of more comprehensive measures of poverty and indebtedness, such as the UNDP's Human Development Index, would extend debt relief to a broader range of poor countries. From this perspective, there is a persuasive case to add Haiti to the current list of eligible HIPCs. Haiti's public external debt amounts to 35 percent of GDP and its NPV debt-to-export ratio is 140 percent, close to the current HIPC benchmark. The bulk of the debt is on concessional terms.

Of course, the proposal to extend HIPC debt relief to more countries would entail additional costs to the international community, especially at a time when the existing initiatives are not yet fully funded. While it is true that, in the case of Haiti, new flows – as grants or highly concessional loans – rather than debt relief would help provide the necessary resources, even these are not forthcoming in the desired volumes. To many observers, the people of the poorest country in the Western Hemisphere are being held hostage to the exigencies of the international community.

Multi-sectoral Global Funds (MGFs)

Multi-sectoral Global Funds (MGFs) are emerging as important innovative mechanisms for financing development and other specific global priorities. MGFs are financed and administered by a partnership comprising governments, international organisations, the private sector and civil society, but yet are more operationally nimble than traditional mechanisms (Heimans, 2003). Even though the proliferation of MGFs may also lead to a comprehensive response to global problems, these funds may not be sufficiently democratically accountable through the national governments that constitute them. Table 8 outlines some basic facts about three MGFs.

The newly established Global Fund for AIDS, Tuberculosis and Malaria (GFATM) is of special regional interest given that, after Sub-Saharan Africa, the Caribbean has the highest incidence of HIV/AIDS. The Caribbean Epidemiology Centre (CAREC) estimates that 500,000 persons or 2.4 percent of the region's population are infected with HIV/AIDS. The region is also struggling with one of the highest AIDS fatality rates of between 60 and 75 percent. In November 2003,

---

8 The six most crucial shortcomings of the HIPC Initiative relate to (i) using inappropriate eligibility and debt sustainability criteria; (ii) the use of overly optimistic growth assumptions; (iii) an insufficient provision of interim debt relief; (iv) the delivery of some HIPC debt relief through debt rescheduling; (v) lack of creditor participation and financing problems; and (vi) the use of currency specific short-term discount rates.

Table 8
Basic Features of Three Multi-Sectoral Global Funds (MGFs)

Fund	Year Established	Current Annual Disbursements	Fiduciary Arrangements
Global Fund for AIDS, Tuberculosis and Malaria national (GFATM)	2002	Estimated at US$700 million in the first full year of operations. Expected to grow in the second year	World Bank is trustee, sub-trustees at level. Disbursements made directly to Governments
Global Environmental	1991, pilot pro-programme; 1994 restructured	About US$600 million per year	World Bank is trustee
Global Alliance for Vaccines and Immunisation (GAVI)	1999	About US$160 million per year over 5 years committed to 53 eligible countries. Expected to grow with further rounds of funding awards	UNICEF is trustee

Source: Heimans (2003).

the GFATM allocated close to 18 percent of total dis-bursements to Latin America, Eastern Europe and 13 CARICOM countries to help fight HIV/AIDS until 2005. This group of countries may receive additional allocations up to 2010. Given the need to dramatically scale up effective HIV prevention programmes in order to substantially mitigate the devastating effect of HIV/AIDS, Caribbean countries will have to demonstrate to the administrators of GFATM that they are indeed worthy recipients of additional assistance.

Remittances

Remittances are a growing force in external development finance. Given the current euphoria associated with these flows, Kapur (2003) wondered whether remittances are a new development mantra, striking the right cognitive chords in exemplifying the principle of self-help. Remittances can contribute to financing investment, providing community infra-structure (such as schools) and funds for new enterprises. On the other hand, Chami, Fullenkamp and Jahjah, (2003) in a rather provocative study, found that remittances may have negative effects on economic growth and do not appear to be a significant source of capital for economic development. Nevertheless, it was not clear from this study whether remittances are an obstacle to growth or the very interaction between remittances and other structural factors leads to unfavourable growth prospects.

Table 9 gives some data on the size of remittances in relation to both GDP and exports of goods and services in the Caribbean. As a percent of GDP, the top three remittance-receiving countries are Dominica, Haiti and St. Kitts. Measured

Table 9
Workers Remittances, 1970 – 1998

Top Three Countries	Remittances/ GDP (%)	Remittances/ Exports of Goods and Non-Factor Services (%)
Lebanon	34.8	269.2
Samoa	23.9	80.6
Eritrea	23.2	88.0
CARICOM		
Antigua & Barbuda	3.9	4.7
Bahamas	n.a.	n.a.
Barbados	1.9	3.5
Belize	4.3	7.5
Dominica	8.1	19.1
Grenada	5.6	12.7
Haiti	6.0	38.1
Guyana	6.2[1]	n.a.
Jamaica	4.4	7.8
St. Kitts	6.0	10.3
St. Lucia	4.3	6.1
St. Vincent & the Grenadines	7	11.8
Suriname	0.1	0.1
Trinidad & Tobago	0.2	0.4
Bottom Three Countries		
Romania	0	0.1
Hungary	0	0.1
Sweden	0	0.1

Source: Chami *et .al.,* (2003), IMF Working Paper 03/189 and UNECLAC paper "Export Promotion Policies in CARICOM Caribbean Economies", 2003.
Note: n.a. means not available.

on the basis of exports, however, the top three remittance-receiving economies are Haiti, Dominica and St. Vincent and the Grenadines. In Jamaica, remittances are soon expected to surpass tourism revenues, becoming the primary source of foreign exchange. Undoubtedly, these large remittance flows are helping to mitigate pressures in the foreign exchange markets and on other macroeconomic imbalances in these countries. This often poses a moral hazard problem for governments who may avoid taking politically costly steps to address underlying problems since they expect remittances to continue to insulate the economy from any negative consequences.

At present, remittances are a stable source of external finance, but could become volatile following the implementation from October 1, 2003 of the Patriot Act in the United States. The Act signalled the beginning of new financial regulations to combat money laundering and terrorism financing and requires banks and other money transfer entities to have formal procedures in place to verify customer identities. This will undoubtedly affect the cost and volume of remittances.

Regional economies, therefore, need to consider policies to change the very nature of remittances from compensatory transfers to investments and to reduce the cost of remittances. Convincing remitters and their recipients to invest a greater portion of remittances in productive activities is likely to be a difficult but not impossible task, given the circumstances of immigrant-sending households.

Conclusion

The aim of this study has been to review the role of the international community and the international financial institutions in assisting Caribbean develop-ment, particularly identifying appropriate engagement strategies for the future. Given the nature of the daunting socio-economic challenges facing many Caribbean economies, national authorities have to carefully consider in particular how to further engage the IMF, whose seal of good-housekeeping is usually seen as imperative to catalyzing other financial flows. At present, there appears to be civil neutrality in respect of policy advice (except for the programme countries) and promising signs of greater cooperation in technical assistance, particularly through CARTAC. However, regional economies have to consider under what circumstances it makes sense to move from a relation-ship based mainly on Article IV surveillance and technical assistance to the usually more contentious financing relationship.

For the smaller regional economies facing weak growth prospects, the PRGF-supported programmes appear to be a good fit. A major issue in this regard is the reliance on the level of per capita income and eligibility under IDA, as the determining criteria, which automatically excludes from PRGF engagement several Caribbean countries facing similar structural constraints. A strong case can be made for using vulnerability criteria in determining concessional access, so that Caribbean countries with GDP per capita limits higher than the current IDA cut-off point of US$875 will be considered for concessional loans from both the IMF and the World Bank.

Given the complexity of the development challenges facing Caribbean countries and the desire to attain the MDGs, it is unlikely that the international financial institutions would have the competence or the flexibility to provide assistance on all aspects of the reform process. United Nations agencies such as the Food and Agri-culture Organisation (FAO), the World Health Organisation (WHO), United Nations Conference on Trade and Development (UNCTAD) and the United Nations Children's Fund (UNICEF) potentially have much to offer in specific areas.

Within this context, there is an urgent need to raise additional external financial flows and there are five promising avenues which are of special relevance to the Caribbean. Regional authorities should carefully consider options to: (i)

make full use of the opening up of new frontiers to aid, without inducing an aid dependency syndrome; (ii) access disbursements under the International Finance Facility (IFF) but be prepared to implement the requisite policies on governance, trade and investment; (iii) join the call for extending debt relief to a broader range of poor countries, including Haiti; (iv) prove to the administrators of the Global Fund for Aids, Tuberculosis and Malaria (GFATM) as well as other Multi-sectoral Global Funds (MGFs) that they are indeed worthy recipients of additional assistance; and (v) change, if possible, the very nature of remittances from compensatory transfers to investments.

In the words of the West Indian Commission of 1992, "This is the time for action."

References

Bourne, C. 2003. "Natural Hazard Vulnerability and Caribbean Economic Development." Statement by President of the Caribbean Development Bank (CDB) at the Thirty-Third Annual Meeting of the Board of Governors, St. Kitts.

Burnell, P. 2003. "Foreign Aid Resurgent: New Spirit or Old Hangover?" Paper presented at World Institute for Development Economics Research (WIDER) Conference on Sharing Global Prosperity, Helsinki, Finland.

Caribbean Centre for Monetary Studies, Caricom Secretariat, and International Monetary Fund. 1997. "Yesterday's Tomorrow: Adjustment and Integration in Small Emerging Economies (A Caribbean Community Agenda)", first edited draft, mimeo.

Chami, R, C. Fullenkamp and S. Jahjah. 2003. "Are Immigrant Remittance Flows a Source of Capital for Development?" *IMF Working Paper* /03/189, Washington, D.C.

Gunter, B. 2003. "Achieving Long-Term Debt Sustainability in All Heavily Indebted Poor Countries (HIPCs)." Discussion Paper prepared for the G-24 XVI Technical Group Meeting, Trinidad and Tobago.

Heimans, J. 2003. "Multisectoral Global Funds as Experiments in Global Governance and the Financing of Global Priorities." Paper presented at the World Institute for Development Economics Research (WIDER) Conference on Sharing Global Prosperity, Helsinki, Finland.

International Monetary Fund. 2003a. "Role of the Fund in Low-Income Member Countries over the Medium Term – Issues Paper for Discussion." SM/03/257, Washington D.C.

7

Financial Development and Economic Growth in Guyana

Gobind Ganga

Abstract

Guyana has undertaken reforms of its financial sector as part of a broader macroeconomic adjustment program and structural reforms since 1988. These have stimulated financial deepening, creation and strengthening of institutions and the building of a viable regulatory infrastructure. In light of this and the critical role of the financial systems in the growth process, (McKinnon (1973), Shaw (1973), King and Levine (1993), Levine (1997), and Levine (1999), Dornbush and Reynoso (1989)), this paper examines the empirical relationship between financial development and long-run growth in Guyana, by using the ratio of bank credit to the private sector to GDP as an indicator of financial development. The Granger-causality technique is used to test the financial-led growth hypothesis to determine which sector, financial or real, leads in the dynamic process of economic development. The study suggests that there is a strong relationship between economic growth and financial development with economic growth preceding the development of the financial market. The results are consistent with the view that the causation between finance and growth depends on the depth and efficiency of the financial system.

1.0 Introduction

There is a large body of literature which demonstrates that the financial system is a critical and inextricable part of the growth process. The literature suggests that financial instruments, markets and institutions mitigate market frictions associated with information and transaction costs and thereby facilitate the allocation of resources across space and time. Specifically, they: facilitate the trading, hedging, diversifying, and pooling of risk; allocate resources; monitor managers and exert corporate control; mobilise savings; and facilitate the exchange of goods and services. These functions in turn influence economic growth through capital accumulation and/or alter the rate of technological innovation.

The relationship between financial structure and economic growth has long been studied empirically and theoretically. Early seminal contributions by Goldsmith (1969), Gurley and Shaw (1967), McKinnon (1973) and Shaw (1973) analysed the underlying mechanism of financial structure on growth. Specifically, McKinnon (1973) and Shaw (1973) argued that financial repression, such as interest rate ceilings, high reserve requirements and directed credit programmes, impedes financial deepening, capital formation and growth. Most recent empirical treatment by King and Levine (1993), Levine (1997), and Levine (1999) of financial deepening onto growth[1] observed a positive relationship. Their findings show that the main channel of transmission from financial development to growth is as a result of increased allocative efficiency rather than the volume of financial resources. In contrast, Joan Robinson (1952) argued that economic development creates demands for financial services which are automatically provided by the system. Other researchers such as Dornbush and Reynoso (1989) and Chandavarkar (1992) are sceptical of the hypothesis that financial development is a prerequisite for growth.

In light of the seemingly conflicting role of financial systems in the growth process, this paper seeks to assess the finance growth nexus and the importance of the financial system in Guyana. The paper is organised as follows: Section II provides an overview of the financial system in Guyana during the pre-reform and reform periods. Section III provides an analysis of the effects of financial reforms. Section IV provides a quantitative assessment of the importance of the financial system in Guyana's economic performance. Section V discusses the policy implications of the empirical results. Lastly, Section VI provides some conclusions.

2.0 Overview of the Financial System

The financial system in Guyana has changed significantly over the last decade. Prior to October 1965 two foreign-owned banks, namely the Royal Bank of Canada and the Barclays Bank D.C.O., conducted commercial banking in Guyana. The Royal Bank of Canada started operations in Guyana in 1914 when it took over the activities of the British Guiana Bank. The latter had been incorporated on November 11, 1836, and began operations on February 16, 1837. Barclays Bank commenced business in 1925, following the merger of three banks - the Anglo Egyptian Bank Ltd., the National Bank of South Africa, and the Colonial Bank which had operated in the colony of British Guiana since 1837. In October 1965, Chase Manhattan Bank of the United States established a branch in Guyana. This was followed shortly by the opening of the Bank of Baroda, with head offices in India, in March 1966.

By the end of 1966 the two dominant banks, the Royal Bank of Canada and Barclays, operated more than twenty-five branches, sub-branches, and agencies, a third of which were located in Georgetown. In the following years many rural

---

1 The services provided by financial intermediaries, such as risk management, researching firms, exerting corporate control and providing liquidity were used.

branches and agencies were closed. These institutions essentially provided short-term trade and working capital finance. At that time, it was felt that the commercial banking sector did not adequately provide the type of financing required to develop the Guyanese economy. As a result, the authorities embarked on a strategy aimed at shaping a financial system that would mobilise deposits and provide loans to rural areas, provide long-term finance for investment, and supply resources in support of local firms.

In response to the need to improve the role of the financial sector, the Government established the Guyana National Co-operative Bank (GNCB) in February 1970. The bank was given the task to provide for commercial financing requirements of Guyanese businesses to support investments in new business areas, and to extend financial services to rural communities where such services were non-existent.

As part of the financial sector restructuring programme, the Government in 1984 started a process of nationalising foreign-owned commercial banks, beginning with the Royal Bank of Canada, the name of which was changed to National Bank of Industry and Commerce (NBIC). The next bank to experience a change in ownership was Chase Manhattan in 1985 (renamed Republic Bank), followed by Barclays in 1987, which was renamed the Guyana Bank for Trade and Industry (GBTI). The Government took control of GBTI in 1988[2] and it was merged with the Republic Bank in 1990. Thus, the Government assumed ownership of a substantial portion of the commercial banking sector and by 1990 owned 95.3 percent of GNCB, 51.02 percent of NBIC and 30.0 percent of GBTI. In 1994, the Government sold most of its shares in GBTI, retaining only 1.3 percent. The ownership of the Bank of Baroda and the Bank of Nova Scotia remained under the ownership of the Government of India and a private Canadian bank, respectively.

In 2000, the financial system in Guyana consisted of a small but wide range of banks and non-bank financial institutions. The Bank of Guyana is the apex of the financial system. Seven commercial banks (four domestic and three foreign-owned) with a network of thirty-six (36) branches dominated the financial system, holding 71 per cent of the total financial assets at the end of 2000 (see Table I). The non-bank financial sector, comprising insurance companies, credit unions, the New Building Society, trust companies and a mortgage bank, accounts for the remaining 29 per cent of financial assets in the financial system.

Guyana's banking system is highly concentrated, with the two largest banks accounting for 65 per cent of total bank assets. The main sources of commercial bank funding are deposits held by the public, which represented 66.7 per cent of total liabilities at end 2000 (see Table II). Credit facilities to residents (both the private and public sector) represent the largest share of assets (see Table II). Investment in Treasury bills accounts for approximately 17 per cent of the share of commercial banks' assets.

---

2 In technical terms, the Barclays Bank and the Royal Bank of Canada were not nationalised. They were sold to the Government of Guyana for G$1.00 each.

Table I
Percentage Distribution of Assets of Financial Institutions in Guyana (1980-2000)

	1980	1985	1990	1995	1997	1998	1999	2000
Commercial Banks	63.9	73.9	64.2	71.6	73.3	74.7	70.8	70.8
Non-Bank Financial Institutions	36.0	26.1	35.8	28.4	26.7	25.3	29.2	29.2
Building Society	5.3	5.8	4.7	7.3	7.7	8.1	8.2	8.8
Trust Companies 1/	1.6	2.0	2.2	5.5	5.6	3.3	6.7	6.5
Insurance Companies	14.6	9.6	15.4	9.5	7.9	8.1	8.1	7.7
Life	9.0	7.1	13.1	6.8	5.5	5.9	6.1	5.8
Non-Life	5.6	2.4	2.3	2.8	2.4	2.2	2.0	1.9
Pension Schemes	8.8	3.5	4.1	6.0	5.5	5.8	6.2	6.2
Mortgage Bank	1.9	1.0	0.3	0.1	0.0	-	-	-
Development Bank[3]	3.8	4.2	9.1	0.0	0.0	-	-	-
Total Assets	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Bank of Guyana.

1/ Includes Finance Companies.

Table II
Percentage Composition of Commercial Banks Assets and Liabilities (1980-2000)

	1980	1985	1990	1995	2000
Assets					
Foreign Sector	6.4	1.1	16.8	6.6	6.7
of which balance due from banks abroad	4.9	0.9	16.2	4.4	3.9
Public Sector	48.8	54.1	34.1	27.0	19.7
of which securities	23.4	26.5	28.5	25.7	17.2
Private Sector Loans and Advances	21.2	16.9	28.7	35.9	45.2
Bank of Guyana	13.6	20.4	12.6	17.9	13.2
of which deposits	4.7	3.2	4.8	16.2	11.7
Other including non-banks	10.0	7.4	7.7	12.6	15.2
Total Assets	**100**	**100**	**100**	**100**	**100**
Liabilities, Capital and Reserves					
Foreign Sector	6.0	2.0	6.0	5.0	4.1
of which balance due to banks abroad	2.5	0.0	3.8	0.5	1.2
Public Sector Deposits	5.5	5.0	13.8	8.2	7.8
Private Sector Deposits	60.9	45.9	49.2	68.8	59.5
Non-Banks Fin. Insti. Deposits	6.4	5.1	10.0	3.2	7.2
Other Liabilities	21.2	39.1	15.3	54.6	2.5
Capital and Reserve	0.0	3.0	5.6	9.4	18.9
Total Liabilities	**100**	**100**	**100**	**100**	**100**

Source: Bank of Guyana.

3 In 1995 the Development Bank was merged with the state owned Guyana National Cooperative Bank.

2.1 Pre-reform Financial Sector

Until the end of the 1980's, Guyana's financial system was characterised by selective credit allocation and interest rate controls. Credit was increasingly directed to specific industries, sectors and public sector corporations while interest rate restrictions were in the form of interest rate ceilings. These policies were motivated by the social aspect of banking i.e. to guard against increases in interest rates and to provide low-cost funding to priority sectors. These policies achieved their objectives. However, monetary policy was restricted to direct controls and changes in the minimum liquid assets and reserve requirements. In addition, financial institutions and markets had either deteriorated or failed to develop. Accounting systems were lax, disclosures were poor and surveillance weak. What resulted was an unstable financial system with a defective regulatory framework making commercial lending very risky as banks were burdened with portfolios dominated by unproductive and nonperforming assets. The operational efficiency of the banks was highly unsatisfactory.

2.2 Financial Sector Reforms: 1988-2000

Guyana has, since 1988, undertaken reforms of its financial sector as part of a broader macroeconomic adjustment programme and structural reforms. Key elements of the reform aimed at improving the efficiency of the financial system and enhancing competition among institutions, strengthening the prudential framework, and developing and deepening financial markets.

2.2.1 Policies to Improve Efficiency and Competition in the Financial Sector

The central features of these reform measures were the removal of restrictions on interest rates, credit and foreign exchange transactions, as well as the use of indirect instruments of monetary policy. In mid-1991, the Central Bank introduced a competitive bidding process for Treasury bill auctions. The bank rate and the rediscount rate were determined by the market-determined Treasury bill rate for 91-day bills. The frequency of Treasury bill auctions increased to bi-weekly auctions in 1995 and then to weekly auctions in February 1996.

While the measures above helped to strengthen monetary control and increase the role of market forces in the financial system, monetary policy continued to rely on direct instruments of monetary control in the form of reserve requirements for commercial banks because of excess liquidity in the financial system. In mid-1991, reserve requirements on demand deposits were increased from 6.0 to 11.0 per cent and on savings and time deposits from 4.0 to 9.0 per cent. In April 1994, the reserve requirements went up further from 11.0 per cent of demand deposits and 9.0 per cent of savings and time deposits to 16.0 and 14.0 per cent respectively. In February 1999, the requirement was reduced to 12 percent on both demand and saving and time deposits. In addition, the scope of reserve requirements was extended to include licensed non-bank depository institutions as well as the definition of reserves to include foreign currency deposits so as to

provide a level playing field for all licensed depository financial institutions. The liquid asset ratio has remained at 25.0 per cent of the banks' demand deposits and 20.0 per cent of time deposits since May 1991. The scope and reporting periods have been changed to reduce administrative cost.

In the external sector, measures included the abolition of exchange controls and the establishment of a market-determined exchange rate system. In 1990, bank and non-bank foreign exchange markets (cambios) were allowed to operate. Partial convertibility of the Guyana dollar was introduced during the same year. Under the new system, two markets - the official and the cambio market co-existed. In February 1991, the exchange rates in the two markets were unified, whereby the official rate was determined weekly based on the average free-market rates for the preceding week. In 1993, the Central Bank began inter-bank cambio market operations to achieve a closer integration of the official and cambio markets. In 1995, the Exchange Control Act was abolished.

A critical element of financial development is the payment system which has been a neglected area in Guyana. However, steps were recently taken to improve the payment system. In 1997, the National Clearing House (NCH) was established. This prescribed the rules and procedures governing clearing and settlement of cheques and legislative amendment was made to give the Bank of Guyana explicit oversight authority for the national payment system. In 1999, the Bank of Guyana developed and published a normative standard for machine processing of cheques which employs the Magnetic Ink Character Recognition (MICR) technology based on the Canadian Banker's Association (CBA) standard, with a bank number identification scheme tailored for Guyana. Under this phase, simulation testing with sample cheques was undertaken followed by the testing of Bank of Guyana cheques presented by collecting banks, and the use of the Extract File by Bank of Guyana to effect direct posting to the Government accounts. Bank of Guyana deposits (i.e., "On- Other" cheques) were also tested.

Reducing the role of the state in the financial sector was seen as critical in improving competitiveness and efficiency in that sector. At the end of 1997, government ownership of financial entities was reduced to 25 per cent of the end-1993 asset value of the group of banks the government owned at that time. This was achieved through the sale of all government shares in the Guyana Bank for Trade and Industry and the National Bank of Industry and Commerce.

2.2.2 Policies to Strengthen the Prudential Framework and Bank Supervision

Concomitant with the relaxation of structural regulations was a step-up of prudential regulations. This was brought about through the enactment of the Financial Institutions Act (FIA) in March 1995. The legislation requires all institutions carrying on banking and financial businesses to be licensed by the Bank of Guyana and it centralises the surveillance responsibility over all financial institutions licensed with the Central Bank.

The improvement in supervision of financial institutions is primarily to promote the transparency of the status of financial institutions, to increase consumer protection and to ensure the safety and soundness of the system. The prudential

requirements emphasise capital adequacy and asset quality. Capital adequacy requirements in line with internationally accepted standards have been implemented. In addition, commercial banks are required to follow the guidelines on the calculation of risk assets that the Bank of Guyana adopted from the Bank for International Settlements (BIS) guidelines.

The FIA also addresses issues such as large exposures, limits on investment in non-bank companies, liquidity ratio, minimum capital for the setting up of a bank, licensing of new banks, insider lending, prohibited operations, loan classification, provisioning and other regulations that would limit risk as well as the concentration of ownership of financial institutions. The off-site surveillance and on-site inspection of banks were strengthened. In addition to the FIA, a revised Central Bank Act designed to increase the independence of the Central Bank in the formulation and operation of monetary policy was passed in parliament.

2.2.3 Policies to Develop and Deepen Financial Markets

Money market and long term debt securities are thin and secondary markets are almost nonexistent in Guyana. To encourage the latter development, the interbank market has been supported by the provision of the enabling framework (i.e. interbank transfer system) recently announced by the Central Bank. Similarly, the government encouraged capital formation and the growth of an efficient securities market, while protecting purchasers of securities and promoting ethical behaviour in the industry through the Securities Act 1998. The Act provides for the registration of securities brokers and dealers, certain self-regulatory organisations and certain issuers of securities. Notwithstanding this, there are virtually no capital account restrictions.

3.0 Effects of Reforms on the Financial System

There are tangible results from the reforms in many areas of the financial system which stimulated financial deepening, creation and strengthening of institutions and the building of a viable regulatory infrastructure. Reforms have caused the range of financial services to expand, especially in the form of deposits and credit instruments with the liberalisation and maintenance of positive real interest rates. Time and savings deposits increased sharply from G$3.8 billion in 1989 to G$18.4 billion in 1992 and to G$60.6 billion in 2000. As a per cent of broad money, quasi-money increased from 62 per cent in 1989 to 70 per cent in 1992 and to 71 per cent in 2000. This indicator suggests that reasonable interest rates, more branches, better service and more diversified savings instruments have contributed to a deepening of the financial system which raised aggregate savings.

In contrast to the quasi liquid assets to M2 ratio (see Table III), the standard financial depth indicator of the ratio of money stock to GDP declined substantially after 1989. It fell from 114.5 per cent in 1988 to 68.1 per cent in 1990 but increased to 79.1 per cent in 2000. In the 1990-2000 period, the ratio has remained relatively stable except for a sharp decline in 1991. Similarly, the ratio of financial assets to GDP, which declined from 165.7 per cent in 1988 to

Table III
Selected Monetary Indicators (1985-2000)

Year	Broad Money M2 % GDP	Deposit % GDP	Finan-cial Assets %GDP	Credit to Private Sector %GDP	Quasi Money (G$ Million)	Quasi Money % M2	Realt Deposit Rate[1]	Real Lend-ing Rate[2]	Infla-tion Rate	Interest Rate Spread[3]	Aver-age Money Multi-plier
1985	115.6	109.2	188.7	31.1	1215.4	64.5	-3.1	-0.1	15.1	...	
1986	122.7	117.5	174.0	36.5	1453.6	65.1	4.1	7.1	7.9	...	
1987	105.2	117.5	155.7	32.3	1859.9	62.0	-16.7	-13.7	28.7	...	
1988	114.5	127.0	165.7	43.9	2462.6	59.8	-28.0	-25.0	40.0	5.5	
1989	68.2	78.3	102.7	27.8	3809.3	61.5	-87.8	-84.0	120.0	6.6	
1990	68.1	77.9	103.5	29.7	5982.9	63.6	-56.9	-54.0	85.0	4.9	
1991	48.4	56.7	74.1	19.8	10256.9	63.1	-41.1	-36.8	70.3	9.0	3.2
1992	64.6	76.1	96.1	21.5	18355.0	70.3	4.0	11.7	14.2	13.1	2.5
1993	67.4	75.9	87.8	20.7	23991.8	71.9	2.2	8.8	8.7	8.7	3.1
1994	61.9	63.7	74.3	27.8	26849.3	68.6	-3.3	3.8	16.1	9.8	3.2
1995	67.3	66.0	77.9	28.2	35332.7	71.6	4.7	11.0	8.1	9.9	3.2
1996	70.0	73.0	94.5	44.1	41543.1	72.1	4.5	12.5	4.5	10.7	2.7
1997	72.3	77.7	99.5	50.5	46930.5	73.0	4.2	12.8	4.2	10.9	2.8
1998	75.9	84.6	111.1	54.0	50874.9	74.1	3.4	12.0	4.6	11.2	2.73
1999	73.3	75.3	99.1	49.6	55431.7	72.0	2.6	5.4	11.9	9.9	3.04
2000	79.1	84.2	108.8	48.3	60618.5	70.9	1.2	11.0	6.2	10.4	3.02

Source: Bank of Guyana's Statistical Abstracts and Annual Reports (various years)
... Not available
1/ Commercial Banks' three month time deposit rate
2/ Average prime lending rate
3/ Weighted average lending rate less average savings rate

102.7 per cent in 1989, remained relatively stable over the 1989-1997 period, with the exception of 1992, and then increased to 108.8 per cent in the year 2000. The decline in these ratios is attributable to the large devaluations of the Guyana dollar between 1989 and 1991, which resulted in considerable expansion of nominal GDP. Specifically, in 1989 the Guyana dollar was devalued by 70 per cent to G$33 per US$1. In 1990, the Guyana dollar was further devalued from G$33 per US$1 to G$45 per US$1. In 1991, the Guyana dollar was again devalued from G$45 to G$101.75 per US$1. In addition, the high level of monetisation (ratio of *M1* and *M2* to GDP) prior to 1989 resulted from the "monetary overhang" that was associated with government deficit financing prior to the implementation of the market-oriented reforms. This was lowered and stabilised with the use of intermediate monetary targets during the period of macroeconomic stabilisation, which has helped to create a consistent framework within which the financial sector can grow further.

Credit dispensation (see Table IV) since 1989 showed the bulk of commercial bank credit going to the private sector. Not only has the credit growth been significant in absolute terms, but the ratio too has improved. The share of credit to the private sector rose from 39.0 per cent in 1985 to 88.0 per cent in 1992 and to over 94 per cent between 1993 and 2000. With fiscal adjustment, the public sector which was the largest borrower, became a net depositor to the banking system. The increase in private sector credit indicates that the banks have been diversifying their loan portfolio and looking out for new loan accounts. The sectoral distribution of the stock of private sector credit, however, shows that credit to business enterprises, including agriculture, manufacturing, mining and services, had declined from 86.0 per cent in 1989 to 83.0 per cent in 1992 and 2000. The share of credit to households, however, went up from 13.3 per cent in 1989 to 17 per cent in year 2000.

The key element of reform from the point of view of monetary management has been the transition to indirect instruments of monetary policy, largely at present through the regular auction of Treasury bills. This has resulted in an improvement in the capabilities of the Bank of Guyana to regulate more effectively the growth in money and credit, *via* a market mechanism. The absorption of excess liquidity through the issue of Treasury bills has brought about better control and management of the money supply, as evidenced by the relative stability of the money multiplier during the 1992-2000 period. The auction mechanism helps to create competitive market conditions by compelling banks to critically examine their funds management practices and the manner of pricing their deposits and loans.

Banks have emerged as the largest holders of government securities and in particular Treasury bills. The public securities in the asset portfolio of banks have gone up from G$4.1 billion in 1990 to G$14.8 billion in 1995 to G$20.3 billion in 2000. This has been largely due to the high yielding and riskless investment character of Treasury bills as well as the fact that banks are unwilling to lend because, for instance, of a perceived increase in the risk of default that cannot be internalised by raising the cost of borrowing. It is important to note that the auctioning of Treasury bills for sterilisation purposes, which has improved the management of liquidity, had resulted in a high interest expenditure to the government of approximately G$35.0 billion during 1991-2000.

Table IV
Commercial Banks Credit Allocation (1985-2000)

Year	Banking System Net Dom. Credit[1] (G$ Million)	Private Sector (G$ Million)	Public Sector (G$ Million)	Credit to Private Sector as %GDP	Private Sector Share of Total Credit	Business Ent. Share of Private Sec. Credit	Household Share of Private Sec. Credit
1985	1411	557	848	31.1	0.39	0.75	0.25
1986	1009	663	334	36.5	0.66	0.76	0.24
1987	1355	943	398	32.3	0.69	0.74	0.26
1988	2145	1559	580	43.9	0.73	0.84	0.16
1989	3219	2519	688	27.8	0.78	0.86	0.13
1990	4914	4109	791	29.7	0.84	0.84	0.16
1991	7092	6620	403	19.8	0.93	0.85	0.15
1992	9896	8680	903	21.5	0.88	0.83	0.17
1993	11277	10207	544	20.7	0.91	0.79	0.20
1994	15076	13799	221	27.8	0.92	0.77	0.23
1995	22190	20657	479	28.2	0.93	0.74	0.26
1996	37162	35864	284	44.1	0.97	0.83	0.17
1997	44540	42921	221	50.5	0.96	0.80	0.20
1998	50048	48872	411	54.0	0.98	0.80	0.20
1999	53885	52166	731	49.6	0.97	0.80	0.20
2000	53596	52195	469	48.3	0.97	0.83	0.17

Source: Bank of Guyana Annual Report (various years).

1/ Includes Non-Bank Financial Institutions.

The greater freedom to acquire foreign exchange combined with a market-determined exchange rate, has enhanced the availability of foreign exchange to the country. The volume of all foreign exchange transactions has grown considerably. Total recorded transactions increased from US$329 million in 1991 to US$1.29 billion in 2000. The cambio market accounted for US$946.5 million or 73.4 per cent of total foreign currency transactions. While the foreign exchange market remains shallow, there has been an increase in the volume of interbank foreign exchange trading which reached almost US$14 million in some quarters. The central bank has been very active in the Foreign Exchange Market. The cambio spread between purchases and sales rates and among banks and non-banks has been increasing (and moreso among bank cambios) as shown in Table V.

While partial internal financial and economic convertibility enhanced the transparency of inter-mediation of foreign exchange in the economy, efficiency is constrained due to the lack of full financial market flexibility because complete internal convertibility, i.e. the legal right of residents to acquire and maintain domestic holdings of certain assets denominated in foreign currencies has not been granted. It is argued that complete internal convertibility may lead to currency substitution or dollarisation and consequent loss of revenue from seigniorage and inflation tax. Also, the authorities ability to conduct monetary policy may be substantially weakened because the foreign currency component of total money supply cannot be directly controlled.

The deregulation of the domestic financial markets and elimination of capital account barriers were important internal factors that contributed to long-term capital inflows and the re-entry of private capital into Guyana. The latter, largely in the form of foreign direct investment, was influenced by increased investors' confidence in the economy. Relatively stable real exchange rate, liberalisation of the financial sector and decontrol of the foreign exchange market to allow repatriation of profit and remittances, provided investors with a stable and less uncertain business environment to make decisions. Consequently, foreign direct investment (FDI), which faced a long, dry period between 1976 and 1990, increased substantially in 1992 to US$138 million and averaged US$54 million annually between 1993 and 2000 as shown in Table VI. Direct foreign investment constituted the entire private capital inflows, replacing commercial bank loans, which dominated prior to 1985, and the nonexistence of portfolio investment.

Table V
Exchange Rate (1991-2000)
(Guyana Dollars Per US$)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
A. Average Cambio Exchange Rate										
Buying	121.30	123.95	128.92	141.98	137.60	138.75	141.60	162.49	178.69	181.94
Selling	123.33	126.28	131.04	144.52	141.65	142.67	144.51	166.91	181.90	185.65
Spread	2.03	2.33	2.12	2.54	4.05	3.92	2.91	4.42	3.21	3.71
B. Bank Cambio Exchange Rate:				**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Buying	-	-	-	136.56	139.22	137.55	141.02	161.21	176.04	176.86
Selling	-	-	-	139.60	143.61	142.36	144.00	167.89	181.57	185.29
Mid Rate	-	-	-	138.08	141.42	139.96	142.51	164.55	178.80	181.08
Spread	-	-	-	3.04	4.39	4.81	2.98	6.68	5.53	8.43
C. Non-Bank Cambio Exchange Rate:										
Buying	-	-	-	138.76	141.30	139.32	140.43	163.60	178.80	182.40
Selling	-	-	-	140.71	143.42	141.41	143.00	166.40	181.60	185.20
Mid Rate	-	-	-	139.74	142.36	140.37	141.72	165.00	180.20	183.80
Spread	-	-	-	1.95	2.12	2.09	2.57	2.80	2.80	2.80

Source: Bank of Guyana.

Table VI
Foreign Direct Investment (1988-2000)
US$ Million

Year	FDI Inflows-Foreign
1988	6.3
1989	10.2
1990	16.4
1991	28.0
1992	137.9
1993	63.3
1994	46.8
1995	53.4
1996	59.0
1997	52.0
1998	44.0
1999	46.0
2000	67.1

Source: Bank of Guyana.

Financial intermediation costs have not shown significant positive adjustments with the liberalisation of interest deposit and lending rates, which are often used as a proxy for efficiency. Financial intermediation remains large because of a lack of flexibility in bank interest rates, although in the recent period a narrowing of the spreads has been observed. This spread went up from 4.9 per cent in 1990 to 13.1 per cent in 1992 and declined to 10.4 per cent in 2000. The large spreads reflected administrative costs, loan loss provisioning, taxes, after tax profit margin and required reserves. Administrative cost is the major contributor to the spread, accounting for over 50 per cent of the total spread. It stands out across all banks, though for the small private banks, it is far more significant, averaging more than 75 per cent of their individual spread. The high administrative costs of these banks are partly explained by financial innovation, in the form of computerisation, ATM machines and debit card facilities undertaken by these banks. A consequence of financial innovation is the employment of qualified staff which results in a higher wage bill, thereby contributing to the high administrative cost. In addition, because of the fact that these banks do not have branches, except for one, their average fixed costs have been higher as their scale and scope of operation have been limited, thereby increasing intermediation cost.

Financial results of banks (Table VII) show that returns on equity and on assets fell during the 1991-1999 period. The ratio of net profit to equity (ROE) declined from 53.5 per cent in 1991 to 27.7 per cent in 1993 and further to 6.5 per cent in 1999. Similarly, the ratio of net profit to asset (ROA) also declined from 9.1 per cent in 1991 to 4.0 per cent in 1993 and to 1.3 per cent in 1999. The

Table VII
Commercial Bank Performance Indicators (1991-1999)

Percent	1991	1992	1993	1994	1995	1996	1997	1998	1999
Net profit to equity - ROE	53.5	37.4	27.7	27.7	16.5	11.5	8.4	8.4	6.5
Net profit to asset - ROA	9.1	5.0	4.0	3.9	2.9	3.2	2.4	1.5	1.3
Operating income to assets	21.3	16.7	14.6	13.9	14.1	12.2	10.7	14.2	14.2
Operating expenses to assets	14.5	11.7	10.5	10.0	11.2	9.0	8.4	11.9	12.5
Operating expenses to operating income	68.3	70.1	72.5	71.9	79.7	79.7	77.9	84.3	88.5

Source: Bank of Guyana.

decline in profit is explained by falling earnings. The ratio of operating income to assets declined from 21.3 per cent in 1991 to 14.2 per cent in 1999 while the operating expenses to assets ratio declined from 14.5 per cent in 1991 to 12.5 per cent in 1999. Moreover, the ratio of total operating expenses to total operating income increased from 68.3 per cent in 1991 to 72.5 per cent in 1993 and to 88.5 per cent in 1999. Provision for bad loans and narrow opportunities to invest excess resources also had an impact on bank profits. In 1991, the ratio of excess reserves to total deposits which was 1.03 per cent declined to 0.16 per cent in 1994 but increased sharply to 3.41 per cent in 1995. The relatively large ratio in 1995 is explained in part by the removal of interest earning on (the) special deposit (scheme) at the central bank at end 1994.

The inability of banks to predict long-term interest rates and assess risk also explains in part banks' excess reserves, falling profits and consequently, the wide interest rate margin. Specifically, when interest rates are forecastable, then the expectation theory of the term structure implies that long-term rates should always reflect actual short-term rates. If interest rates are unforecastable, then there will be mismatches between long and actual short rates. These maturity gaps cause problems for financial intermediaries who typically borrow short term and lend long term. In view of this, banks are reluctant to lend in the long term.

Prudential regulations and banking supervision have been strengthened considerably in recent years. As a result, the soundness of the banking system has improved. The capital base of banks has been enhanced since 1991. The level of capital increased from G$2.1 billion in 1991 to G$5.4 billion in 1995 to G$22.3 billion in 2000. As a share of total assets, capital increased from 8.2 per cent in 1991 to 9.4 per cent in 1995 to 19 per cent in 2000. The average risk-weighted capital adequacy ratio was well above the minimum 8 per cent required after 1995.

Non-performing loans declined between 1992-1997[4] but rose thereafter. In 1997, they amounted to 14 per cent of total loans, much lower than the 22.7 per cent in 1995 and 40.69 per cent in 1992. Expressed in terms of total assets, there was also a decline from 10.4 per cent in 1992 to 8 per cent in 1997. The share of general provisions decreased, with a reduction in non-performing loans during the 1992-1997 period, but grew after 1997. Provisions as a percentage of non-performing loans decreased from 63.5 per cent in 1992 to 51 per cent in 1997 but grew again to 57 per cent in 2000.

4.0 Financial Intermediation and Economic Growth

4.1 Financial Development Indicators

There is no precise definition as to the meaning of financial development. However, several indicators of financial depth have been proposed in the literature. A number of empirical studies have used a variety of monetary aggregates to analyse the correlation between financial intermediaries and economic growth. The liquid form of monetary aggregates such as *M1* or broader measures such as M2 have been used but these variables are merely related to the ability of the financial system to provide liquidity, or a medium of exchange rather than the ability to allocate credit efficiently. The broader monetary aggregate of *M3* or liquid liabilities of the banking system was used but it still contains M1 which is largely related to the provision of transaction services by the financial system and not with the channelling of savings to borrowers. In view of this, indicators of quasi-liquid assets where *M1* is subtracted from *M2* have been relied on.

In this study, the ratio of domestic credit to the private sector to GDP is used as a proxy for the degree of financial intermediation. This monetary aggregate excludes credit to the public sector and represents the role of financial intermediaries in channelling funds to the private sector. It is also closely related to the level and efficiency of investment, and hence to economic growth. Further, in view of the fact that financial development has occurred largely in the banking system, credit is the better proxy for financial development broadly defined. The indicator of economic development is real GDP. The annual data used are for the combined pre-reform and reform period 1975-2000 and the reform period 1985-2000 period, during which deregulation and liberalisation have been prominent.

4.2 Model Specification

The Granger-causality technique is used to test the financial-led growth hypothesis to determine which sector, financial or real, leads in the dynamic process of economic development. Granger's definition of causality between any two variables could be represented as follows: if *X* (credit) causes *Y* (GDP), then changes in *X* should precede changes in *Y*. Therefore, X should help to predict *Y*

---

4 Net of one government-owned commercial bank.

and *Y* should not help predict *X*. If *X* helps to predict *Y* and *Y* helps to predict *X*, it is more likely that one or more variable are in fact "causing" both *X* and *Y*. In order to test whether these conditions hold, *Y* is regressed against lagged values of *Y* and lagged values of X and then Y are regressed only against lagged values of *Y*. In log-linear form, this can be expressed as follows:

$$lnY_t = \sum_{i=1}^{m} a_i lnY_{t-i} + \sum_{i=1}^{m} b_i lnX_{it-i} + \varepsilon_{1t} \quad (1)$$

$$lnY_t = \sum_{i=1}^{m} a_i lnY_{t-i} + \varepsilon_{2t} \quad (2)$$

The null hypothesis that real GDP (Y_t) does not cause credit (X_t) is expressed as

$$lnX_{it} = \sum_{i=1}^{m} a_i lnX_{it-i} + \sum_{i=1}^{m} b_i lnY_{t-i} + \varepsilon_{3t} \quad (3)$$

$$lnY_{it} = \sum_{i=1}^{m} a_i lnX_{it-i} + \varepsilon_{4t} \quad (4)$$

The Augmented Dickey-Fuller (ADF) test is used to establish evidence and degree of cointegration of each variable. The ADF statistics suggest that all the variables are integrated of order one i.e. without a time trend. These results provide a good ground for employing the case of a cointegrated technique in order to test for the existence of a stable relationship between real GDP and financial sector development (X_t) ratio of real private sector credit (PSC) to GDP.

Following the results of the cointegration test, the Granger-causality test is conducted using the error correction coefficient as specified in the following form:

$$ln\Delta Y_t = \sum_{i=1}^{m} a_i ln\Delta Y_{t-1} + \sum_{i=1}^{m} b_i ln\Delta X_{t-1} + ECM_1 + \varepsilon_t \quad (5)$$

$$ln\Delta Y_t = \sum_{i=1}^{m} a_i ln\Delta Y_{t-i} + ECM_2 + \varepsilon_t \quad (6)$$

$$ln\Delta X_{it} = \sum_{i=1}^{m} a_i ln\Delta X_{t-i} + \sum_{i=1}^{m} b_i ln\Delta Y_{t-i} + ECM_3 + \varepsilon_t \quad (7)$$

$$ln\Delta Y_{it} = \sum_{i=1}^{m} a_i ln\Delta X_{it-i} + ECM_4 + \varepsilon_t \quad (8)$$

Table VIII
Results of Integration Tests

Series	Series in levels		Series in first-differences	
	^{t}ADF	Lags	^{t}ADF	Lags
Real GDP	-0.32	1	-4.14*	1
PSC/GDP	-2.01	1	-3.15*	1

Notes: * Denotes statistically significant at 5% level.

Table IX
Results of Cointegration Tests

Cointegrating Regression	^{t}ADF	Lags	R^2
Real GDP = f(PSC/GDP)	-1.94	0	0.16

Notes: For 23 observations, critical values at 5% level +/- 3.15.

4.3 Empirical Results

The results of integration tests for the two series used in the analysis, that is, real GDP *(Y)* and ratio of private sector credit to GDP *(X)* are presented in Table VIII. The null hypothesis is that the variable in question contains a unit root, the alternative being that there is trend stationarity in the variable in question. The Augmented Dickey-Fuller (ADF) tests suggest that all the variables are integrated of order one, i.e. they achieved stationarity after first-difference. Since the results indicated that the series were of the same order of integration, a test of cointegration are conducted. The results are presented in Table IX. The results detect no evidence of cointegration of the ratio of private sector credit to GDP at the 5 percent level of significance and suggest that there is no long-run relationship between the two variables.

The result of the Granger-causality tests, equations (3) and (4), are presented in Tables X and XI. The results suggest unidirectional Granger-causality running from economic growth to financial development.[5] With decreasing lag lengths, financial development (proxy by ratio of private sector credit to GDP) is caused

5 Using data for the financial liberalisation period after 1985, the Granger-causality results suggest a stronger unidirectional Granger-causality running from economic growth to financial development.

Table X
Results of Granger-Causality Tests (1975 – 2000)

Private Sector Credit/GDP on GDP				GDP on Private Sector Credit/GDP		
No. of lags	**F-Ratio**	**Results**	**Causality**	**F-Ratio**	**Results**	**Causality**
1	0.006 (1, 23)	fail to reject Ho	no causality X $\not\rightarrow$ Y	5.35** (1,23)	reject Ho	causality Y $\rightarrow$ X
2	1.545 (2,22)	fail to reject Ho	no causality X $\not\rightarrow$ Y	3.01* (2,22)	reject Ho	causality Y $\rightarrow$ X
3	1.402 (3,21)	fail to reject Ho	no causality X $\not\rightarrow$ Y	1.402 (3,21	fail to reject Ho	no causality Y $\not\rightarrow$ X

Notes: ** denotes statistically significant at 5% level.
* denotes statistically significant at 10% level.
Figures in parenthesis are degrees of freedom.

Table XI
Results of Granger-Causality Tests (1985 – 2000)

Private Sector Credit/GDP on GDP				GDP on Private Sector Credit/GDP		
No. of lags	**F-Ratio**	**Results**	**Causality**	**F-Ratio**	**Results**	**Causality**
1	1.88 (1, 14)	fail to reject Ho	no causality X $\not\rightarrow$ Y	7.37* (1,14)	reject Ho	causality Y $\rightarrow$ X
2	3.05 (2,13)	fail to reject Ho	no causality X $\not\rightarrow$ Y	2.47 (2,13)	fail to reject Ho	causality Y $\rightarrow$ X

Notes: * denotes statistically significant at 10% level.
Figures in parenthesis are degrees of freedom.

by real output. Higher levels of economic growth can encourage the development of the financial services in the country. This seems obvious, given the underdeveloped state of the financial markets with limited range of financial instruments and conservative lending practices.

5.0. Policy Implications of Empirical Results

The empirical results, which suggest that economic growth promotes financial development, have important policy implications in Guyana. The financial system, which is predominantly bank-based, has been effective in mobilising savings as shown in Table III. However, the system has been constrained in its ability to allocate these funds into productive investments. The increase in the financial system's actual holdings of excess reserves and government securities[6] reflects credit rationing[7] which has been motivated by higher perceived uncertainty or risk of default. In such situations, the aim should not only be for policy to increase liquidity and force interest rates downward to stimulate demand for loans but to adopt policies that enable the financial system participants to deliver the services in which they specialise with maximum effectiveness. To this end, it is desirable to have infrastructural policy measures that could promote an efficient functioning system.

The ability of creditors to enforce claims is key to the development of an efficient financial system. On a regional comparison, Guyana's creditors' rights are neither specifically weak nor strong. But, there is evidence of the absence of restraints on the abuse of insider power to tunnel out (the appropriation of the firm's assets by insiders) the resources of a problem firm out of the sight of financial intermediaries. This makes creditors reluctant to provide long-term debt financing. Therefore, it is necessary that there is a strengthening of commitment compliance from individual agencies whereby creditors' rights can, in the event of default, be expeditiously and inexpensively exercised. The laws and legal practice in areas affecting finance would have to be updated and refined to provide legal protection in the form of adequate collateral laws and an effective judicial system to allow financial intermediaries to write strong contracts and to enforce them in the court of law. Nevertheless, banks should continue to exploit their skills in the social function of project appraisal and monitoring and not only rely on taking collateral and its legal protection as a last resort.

Alleviation of the underlying information deficiencies that restricted banks from providing credit is important in fostering an efficient financial system. This requires improvement of the information infrastructure and technology that would provide for the collection, processing and sharing of information[8] about borrowers

---

6 These are issued for the sterilisation of excess liquidity.

7 The incidence of credit rationing increased after 1996.

8 The sharing of information can also mean lenders lose some of the market power that goes with the information.

so that lenders can learn more about current and potential customers. With better and more information flows, banks would be able to identify and fund those entrepreneurs with the best chances of successfully implementing innovative products and production processes. As such, they would be able to partly escape the adverse selection trap which often leads to credit rationing. Sharing information can also reduce moral hazard by increasing the costs of delinquency and thereby disciplining borrowers. Consequently, this would help in reducing intermediate costs and improve loan availability.

Financial institutions would have to strive and adhere to international standards and best practices for the development of efficient financial intermediation. A high standard of prudential regulation would need to be maintained to ensure financial system efficiency without compromising safety and stability in the financial system. A balance would have to be maintained between over-regulation, which could inhibit growth and development of the financial system, and under-regulation which could undermine public confidence. Efforts would have to be directed to recapitalise banking institutions, manage non-performing loans, and provide incentives so that they become a catalyst in transforming and further developing the economy.

The improvement of operational efficiency and competitiveness of the banking system is necessary to reduce the high cost of borrowing as reflected through the intermediation spread in Guyana. This would require innovativeness, flexibility, product development and skill enhancement with partial focus on risk management capability (Ganga, 2000). Adequate control and systems need to be in place to ensure that there is no excessive risk taking that could result in adverse consequences. This need is heightened by the emergence of new risks from globalisation. Management systems are needed to measure credit and market risks so that appropriate measures can be undertaken in order to control the "value of risk" within prudent limits.

Guyana has faced difficult political problems stemming from pre and post election disturbances since 1997. These have affected business confidence and resulted in a reduction in access to credit, as the incentives for efficient and sound intermediation have been impaired. It is therefore imperative that political tensions are removed and public confidence in the political system restored and maintained to boost credit supply and private sector investments.

The successful implementation of am appropriate economic policy framework is an important component to ameliorate constraining factors on credit. The policy framework must be conducive to restoring the international competitiveness of the domestic economy and recovering the historical trend growth rate. This will require the continuation of strong macroeconomic policies, deepening of structural reforms and enhancement of the social development agenda, with particular emphasis on education, health and the environment. Specifically, government will have to intensify its efforts in providing systemic support as outlined in the Guyana Poverty Reduction Strategy Paper (Draft PRSP 2001). These include policies for export and investment promotion, land reform, expanding the economic base, restructuring and modernising the traditional sector, developing new sectors to support growth and good governance. These would undoubtedly restore confidence in the economic and political systems to stimulate economic growth and financial sector development.

6.0 Conclusions

This paper examines the empirical relationship between financial development and long-run growth by using the ratio of bank credit to the private sector to GDP as an indicator of financial development. The study suggests that there is a strong relationship between economic growth and financial development with economic growth preceding the development of the financial market. The results are consistent with the view that the causation between finance and growth depends on the depth and efficiency of the financial system.

In the post 1980's, Guyana experienced significant progress in financial deepening following financial reforms, with the financial system remaining bank-based. Financial liberalisation led to mobilisation of higher levels of savings and time deposits, and expansion of the number of commercial banks. The intermediation spread has been wide and the flow of credit to the private sector has been restricted, as reflected through the holding of high levels of excess liquidity and government securities. Together, they point to a low level of financial system development.

There is an urgent need to develop the financial system so that participants can deliver the services in which they specialise with maximum effectiveness. Reforms in creditor rights need to be adopted to enforce security interests in financial transactions. In addition, an appropriate framework has to be developed to facilitate the sharing of information between financial institutions so as to reduce frictions in the credit market. The regulatory and supervisory framework would have to be enhanced to promote a stable and efficient system. Equally important is the adoption and maintenance of credible and sound macroeconomic as well as institutional policies. In this regard, political stability and avoidance of civil unrest are essential components.

Bibliography

Bank of Guyana (Various Years). *Annual Reports.* Georgetown. Guyana.

Beck, Tornsten, Ross Levine and Norma Loayza. 1999. "Finance and the Sources of Growth" *Policy Research Working Paper 2057,* Washington, DC.: The World Bank.

Chandavarkar, Anand. 1992. "Of Finance and Development: Neglected and Unsettled Questions." *World Development,* 20(1): 133-42.

Demetriades, Panicos, and Khaled Hussein. 1996. "Does Financial Development Cause Economic Growth? Time-Series Evidence from 16 Countries" *Journal of Development Economics* 51, No. 2: 387-411.

Ganga, G. N. 1998. "Stabilisation and Financial Adjustment in Guyana," *Money Affairs.* CEMLA, Mexico City.

Ganga, G. N. 2000. "Credit, Excess Liquidity and Monetary Policy Issues In Guyana," *Social and Economic Studies* 49, Nos. 2 & 3: 199-224.

Goldsmith, R. 1969. *Financial Structure and Development.* New Haven: Yale University Press.

Government of Guyana. 2001. "Poverty Reduction Strategy Paper, (Draft)" Georgetown, Guyana.

Greenwood, Jeremy, and Boyan Jovanovic. 1990. "Financial Development, Growth and the Distribution of Income." *Journal of Political Economy* 98, No. 5: 1076-107.

Gurley, J.G., and E.S. Shaw. 1967. *Financial Structure and Economic Development.* Economic Development and Cultural Change.

Khan, Mohsin S., and Abdelhak S. Senhadji. 2000. "Financial Development and Economic Growth: An Overview" *IMF Working Paper* 00/209, Washington D.C.: International Monetary Fund.

King, Robert and Ross Levine. 1993b. "Finance and Growth: Schumpeter Might Be Right." *Quarterly Journal of Economics* 108, No. 3: 717-37.

Levine, Ross. 1997. "Financial Development and Economic Growth: Views and Agenda." *Journal of Economic Literature* 35, No. 2: 688-726.

Levine, Ross. 1999. "Law, Finance, and Economic Growth." *Journal of Financial Intermediation* 8, Nos. 1-2: 8-35.

McKinnon, Ronald I. 1973. *Money and Capital in Economic Development* Washington, D.C.: Brookings Institution.

Robinson, Joan. 1952. "The Generalisation of the General Theory." *The Rate of Interest, and Other Essays.* London: Macmillan, 67-142.

Shaw, Edward. 1973. *Financial Deepening in Economic Growth.* New York: Oxford University Press.

8

Analysis of Saving Behaviour in Guyana

Tarron Khemraj & Anand Persaud***

Abstract

This paper examines the determinants of domestic saving in Guyana for the period 1965-1999. Each univariate time series was tested for stationarity utilising tests for unit roots. The Johansen test, which found no cointegrating vector between saving and its determinants, was then conducted to establish whether at least one long-run relationship existed among the variables. Different models were then estimated within the context of the general-to-specific model selection criterion. Results indicate that income, foreign saving, financial deepening, government saving and domestic credit to individuals all determine saving behaviour in the long-run, while real interest rate had no significant influence on saving behaviour in the long-run. Real interest, income and foreign saving exert significant influence on savings in the short-run.

1. Introduction

Sustained economic growth depends on a stable flow of investment resources, which in an open economy may come from external sources (in the form of foreign aid, debt relief, external borrowing and foreign investment), from favourable trade balances, and from domestic saving (surplus of income over consumption). In the 1993 *World Economic Outlook*, the International Monetary Fund proposed the view that the most successful developing countries tend to have saving rates that are markedly higher than the rates of their less successful counterparts. The leading developing countries, noted the Fund, generally finance a larger proportion of their investment from domestic saving rather than foreign saving; and when they do rely on external financing it is mainly in the form of foreign direct investment or equity financing, rather than debt financing.

* Research Assistant at the Bernard Schwartz Centre for Economic Policy Analysis, New York.

** Current Lecturer in the Department of Economics, Faculty of Social Sciences, University of Guyana.

Very few would doubt that domestic saving – rather than foreign aid, debt relief, or overseas borrowing – must form the bulk of investment resources. Therefore, the issue of the mobilisation of savings domestically becomes central in any economic policy agenda. A first step in any mobilisation effort must be the identification of the factors that influence domestic saving. With this in mind, the paper addresses the issue of the deter-minants of domestic saving by utilising conventional econometric tools. In addition to estimating error correction models where short-run and long-run coefficients are estimated simultaneously, the modelling exercise adopts tests for unit roots and co-integration. The general-to-specific methodology is adopted to achieve the best possible approximation of the data-generating process.

The remainder of the paper is organised as follows: Section 2 reviews past empirical and theoretical work on the determinants of saving. The primary focus of this section is to establish an eclectic model of saving that can be tested empirically. Several issues pertaining to the data set are presented in Section 3. Section 4 outlines the econometric methodology and other issues related to finding the parsimonious saving equation. The paper ends with a discussion in Section 5 of the implications the empirical findings might have on domestic saving mobilisation.

2. Theoretical and Empirical Discussion

2.1 Domestic Saving and Real Interest Rate

Within the context of the models of financial repression of McKinnon (1973) and Shaw (1973), the real deposit rate of interest is seen as a major deter-minant of saving. It is postulated that the removal of interest rate controls to allow the real deposit rate to converge to its true market clearing levels will alter the intertemporal rate of substitution in favour of an increase in aggregate domestic saving. The change in interest rate, however, like any other price change, results in a substitution and an income effect. Saving will respond positively as is predicted by the financial repression models if the substitution effect is stronger than the income effect, but the response will be negative should the income effect be greater than the substitution effect.

Econometric analyses of the relationship between saving and the real rate of interest have been inconclusive. Fry (1995) summarises his earlier work (1978 and 1980) regarding the impact of interest rate liberalisation on the rate of saving. He estimated a pooled time-series national saving equation for 14 developing countries in Asia over the period 1961 to 1983 and found a positive and statistically significant relationship between the two variables in question. In contrast, Giovannini (1983 and 1985) revisited Fry's earlier work and found that two observations for 1967 and 1968, following the Republic of Korea's financial reform in 1965, could have accounted for Fry's conclusion. After omitting these two observations and expanding the data set, Giovannini found that the real rate of interest did not significantly affect aggregate saving. Warman and Thirlwall (1994) tested the relationship between saving and the real interest rate for Mexico, using data from 1960 to 1990. They found that the interest rate has a significant and positive influence on financial saving, but its effect on aggregate saving and

private saving is insignificant. In a recent study Bandiera[1] *et. al.,* (2000) estimated separate saving equations for eight countries, then they estimated a pooled time-series regression for the same eight countries. They found no conclusive evidence with respect to the saving-real interest rate relationship when the equations were estimated separately. However, the pooled time-series estimate suggest that the real interest rate has a significantly positive effect on saving, though the coefficient estimate is small.

In terms of Caribbean studies, Watson and Ramlogan (1990) estimated a saving equation for Trinidad and Tobago using the Engel and Granger two-step approach to estimate the Error Correction Model (ECM). The Engel-Granger co-integration test was also performed in this study. Real interest rate was found to be an important factor in explaining saving behaviour in the long-run rather than the short-run. Wood (1995) also utilised the ECM approach along with the test for co-integration to explain private saving in Barbados. This time the ECM was obtained using Hendry's general-to-specific methodology by first estimating an over-parameterised equation and then simplifying it until the best representation of the data-generating process was achieved. The private saving-real interest rate relationship was statistically significant, with the coefficient being negative, possibly reflecting the intensity of the income effect as it dominates the substitution effect. Ganga (1995) also estimated a saving model for Guyana and found a positive and significant relationship between domestic saving and real interest. However, the model was of a static nature and most likely is susceptible to spurious regression problems, given the non-stationary nature of the data.

The failure to detect a systematic relationship between saving and real interest rate across countries and across time may be due to several factors. Firstly, the interest elasticity of saving may be dependent on the level of development. Ogaki *et. al.,* (1996) showed that the interest elasticity is close to zero in low-income countries, but it rises steeply in middle-income countries, and increase further in high-income countries. Secondly, they show that the saving-interest rate nexus may be fragile because of the rudimentary nature of financial markets in many LDCs. Thirdly, the relationship may be distorted in low-income countries because of the existence of borrowing constraints (Edwards, 1996; Mavrotas and Kelly, 1999). The lack of liquidity reduces consumption or alternatively induces saving. The relaxation of this constraint, as is the case under liberalisation programmes, results in the increase in consumption or, alternatively, a reduction of saving. In such a situation, saving may be more responsive to income changes rather than changes in the rate of return.

2.2 Domestic Saving and Income

The saving-income relationship is encapsulated under three main theories: the Keynesian absolute income hypothesis, Friedman's permanent income hypothesis and the life cycle hypothesis that is associated with the work of

---

1 This study utilises the new data set of the World Bank.

Modigliani and other researchers. The absolute income theory postulates that saving is a linear and positive function of current disposable income. The permanent income hypothesis posits that saving is dependent on permanent and transitory aspects of income. Permanent income is defined in terms of lifetime expectation of income and requires information on the individual's planning horizon. Transitory income refers to the unanticipated changes in income or windfall gains or losses of income. A major issue involves obtaining suitable proxies for permanent and transitory income. Gupta (1984) used a three-year moving average to proxy permanent income, and the difference between the actual income series and the moving average series is used to proxy transitory income. Income growth is expected to exert a positive effect on saving within the life-cycle theory. As the economy grows, workers' saving will increase relative to dissaving of the dependent population, thus causing aggregate saving to increase. But there can be the opposite effect where, in a growing economy, workers anticipate future income increases and thus tend to increase present consumption. However, causality may run both ways for the saving-growth relationship, thus adding simultaneity bias in an empirical saving equation. Another proxy used to test the life-cycle theory is the population dependency ratio, which is usually defined as the proportion of the population below 15 and over 64 divided by the population aged 15 to 64.

For a comprehensive discussion of early empirical studies involving saving and absolute income see Mikesell and Zinser (1973). Watson and Ramlogan (1991) found a significant and positive relationship for these two variables, though the marginal propensity to save is fairly high. Ganga (1995) also found a significantly positive coefficient for Guyana. Gupta's 1984 study, which tested separate equations for twelve (12) Asian countries, found mixed results where all the coefficients of permanent income were significant, while only half the countries gave significant coefficient for transitory income and the expected magnitudes of the income coefficients were inconsistent with prior expectations. However, most studies seem to vindicate the positive relationship between saving and the rate of growth of income (Fry, 1978, 1980; Giovannini, 1983, 1985). Fry (1995) confirmed the inverse relationship between saving and the population dependency ratio.

2.3 Domestic Saving and Foreign Capital Inflows

There are essentially two broad issues emanating from the theoretical discussion on the relationship between domestic saving and foreign saving and these are whether foreign saving is complementary to or is a substitute for domestic saving. The theoretical underpinning for the complementary relationship stems from the two-gap model. The basis of the two-gap model is that foreign saving will supplement the domestic saving-investment gap and the foreign exchange gap. The model assumes that domestic saving and foreign exchange will rise by the full value of the foreign capital inflows.

Griffin (1970) challenged this view by arguing that foreign aid will act as a substitute for domestic saving. He used a two-equation model: one is the accounting identity that saving equals income minus consumption, and the second

is a simple consumption function with foreign aid on the right hand side. An increase in aid increases consumption and therefore reduces domestic saving. Another theory holds that foreign capital will displace public saving by enabling governments to relax their tax collection efforts.

A number of empirical studies have included foreign saving as a determinant of domestic saving. Fry (1978, 1980) and Giovannini (1985) found a significant negative effect between the two variables. Gupta (1987) found a significant and positive relationship for Latin America, but not for Asia. Schmidt-Hebbel *et al* (1992) established a negative relationship and concluded that foreign saving acts as an external liquidity constraint, thereby increasing consumption and reducing household saving. Both Watson and Ramlogan's 1991 study and Wood's 1995 study found an inverse relationship for the two variables. White (1992) provided an excellent overview of the shortcomings of several past research studies on the aid-saving relationship. He faulted many past pro-substitution studies on the grounds of limited theoretical basis for their regressions, poorly specified equations and data limitations.

2.4 Saving and Financial Development

It has long been postulated that deepening of the financial sector to include a widespread network of financial institutions and a diversified array of financial instruments will enhance the mobilisation of domestic saving. Overall, it can be said that financial development encourages formal savings which are then available for reinvestment, rather than being held in assets outside the financial system. Also, a well-developed financial system enhances the liquidity of saving, which is particularly important because saving is often used as a precautionary device to guard against uncertainty (Mavrotas and Kelly, 1999). Stock markets, banks, mutual funds and other financial institutions increase the liquidity of savers by enabling them to liquidate their financial assets easily. Savings may also be enhanced because the financial system as a whole is able to overcome problems of moral hazard and adverse selection. According to Fry (1995) financial inter-mediaries are able to pool funds to acquire information so as to enable them to allocate capital to its optimal use. Also, given their diversified portfolio holdings they are able to experiment with projects of varying degrees of uncertainty and returns, thereby minimising transaction costs and facilitating saving and investment. An important issue is the development of a suitable measure of financial development since this process is multidimensional and often includes several key phases of reform. A very simple and popular measure is the financial intermediation ratio *(FIR),* where *M1* or *M2* is expressed as a ratio of GDP or GNP (see Gupta 1984; Edwards, 1996). This measure is often criticised as being too restrictive, but for many LDCs and in particular, Guyana, *M2* constitutes the largest proportion of outstanding financial assets of the non-financial private sector. But while the expected coefficient of M2 as a measure of the degree of financial deepening is positive, it can turn out to be negative if the economy is characterised by the existence of a persistent liquidity constraint.

2.5 Aggregate Saving and Government Saving

Disaggregated data for private saving are unavailable for Guyana. However, it is still possible to deduce, through an examination of the relationship between aggregate domestic saving and government saving, whether private sector saving and government saving are related (Fry, 1995).[2] If domestic and government saving are positively related, then government saving is not a close substitute for private saving. Conversely, if domestic and government saving are negatively related then the latter is a close substitute for private saving. Of particular importance is the classical Ricardian equivalence case where a given increase in government saving would be reflected in an equal decline in private saving, giving a negative one-to-one relationship between the two variables, or a coefficient of negative one. However, a coefficient that is between 0 and minus 1 would imply that there is not a complete crowding out of private saving by government saving. Of course, a positive coefficient that is less that 1 indicates that an increase in government saving is translated into higher private saving and thus aggregate saving.

2.6 The Model

In light of the theoretical and empirical discussion above, the following long-run equilibrium relationship is postulated to represent domestic saving behaviour in Guyana.

$$SD_t = \beta_0 + \beta_1 RI_t + \beta_2 Y_t + \beta_3 FS_t + \beta_4 FIR_t + \beta_5 GS_t + \beta_6 CI_t \qquad (1)$$

SD represents aggregate domestic saving, *RI* is real rate of interest, *Y* is real disposable income, *FS* is foreign saving, *FIR* is the financial intermediation ratio or the financial development proxy, *GS* is government saving and *CI* represents domestic credit to individuals, the proxy for borrowing constraints. The coefficient β_1 can be either positive or negative, depending on the relative strength of the substitution and income effect resulting from changes in the rate of return. The marginal propensity to save is represented by β_2 and it must be positive and lie between 0 and 1; β_3 can be positive if *FS* is complementary to *SD,* or negative if *FS* is substituted for *SD;* and β_4 is expected to be positive since the deepening of the financial system is postulated to enhance *SD.* It must be noted, however, that it is possible for β_4 to be negative, thereby signalling the existence of borrowing constraints. Of importance also is whether β_5 and β_6 are negative.

---

2 Private saving can be computed directly by subtracting private consumption from disposable income, or indirectly, as the difference between aggregate investment and the sum of public saving and foreign saving. However, this requires three data sets: the balance of payments, government budget and national accounts. Given the problems associated with each data set this may add a tremendous amount of bias to the private saving series.

If lagged values up to the first order are introduced to equation (1) and the equation is reparameterised, the following Error Correction Model (ECM) will result:

$$\Delta SD_t = b_1\Delta RI_t + b_2\Delta Y_t + b_3\Delta FS_t + b_4\Delta FIR_t + b_5\Delta GS_t + b_6\Delta CI_t - b_7(SD_{t-1} - b_0 - b_8 RI_{t-1} - b_9 Y_{t-1} - b_{10} FS_{t-1} - b_{11} FIR_{t-1} b_{12} GS_{t-1} - b_{13} CI_{t-1}) \quad (2)$$

ΔSD is a function of first differences and levels of the hypothesised variables, and the extent of departure in the previous period from the long-run equilibrium relationship (1). To estimate equation (2) and test it econometrically we must multiply out the disequilibrium error to obtain equation (3).

$$\Delta SD_t = b_0 b_7 + b_1 \Delta RI_t + b_2 \Delta Y_t + b_3 \Delta FS_t + b_4 \Delta FIR_t + b_5 \Delta GS_t + b_6 \Delta CI_t - b_7 SD_{t-1} + b_7 b_8 RI_{t-1} + b_7 b_9 Y_{t-1} + b_7 b_{10} FS_{t-1} + b_7 b_{11} FIR_{t-1} + b_7 b_{12} GS_{t-1} + b_7 b_{13} \Delta CI_t \quad (3)$$

The short-run parameters are represented by b_1, b_2, b_3, b_4, b_5 and b_6 while the long-run parameters are represented by b_8, b_9, b_{10} *and* b_{11}, b_{12} and b_{13}.

3. Data Issues and Definition of Variables

The study is conducted over the period 1965 to 1999 since data exist for all the variables over this range. The data used in this study came from three secondary data sources: the IMF's *International Financial Statistics*, the World Bank's *World Tables* and the Bank of Guyana's *Statistical Bulletins*. The univariate time series – *SD, Y, FS, GS* and *CI* – are deflated into real variables using the 1980 CPI series. Real interest rate is computed by subtracting the annual rate of inflation from the annual average nominal deposit rate. The nominal deposit rate is represented by the weighted average of time deposits and saving deposit rates. GDP acts as the proxy for disposable income *(Y),* while *FIR* is calculated by dividing the annual stock of money and quasi money *(M2)* by the relevant annual GDP. It can be shown that aggregate saving *(SD)* minus gross domestic investment *(I)* is equal to the current account balance (CAB). If *SD<I* then the CAB must be negative (or in deficit), thus representing the use of foreign saving. Therefore, the CAB acts as the proxy for *FS* in this study. The difference between the government's current revenue and current expenditure represents *GS,* while domestic credit to individuals act as a proxy for *CI.*

Potential measurement errors may result from the GDP data, which tended to be underestimated over the period when the Guyana economy was characterised by various restrictions. Also, the CPI series would have excluded higher prices in the parallel market. But with the introduction of appropriate

price incentives after 1988 there is greater coverage as more production came under the purview of the official economy post 1988. Another problem may result from the *FS* data since components of the balance of payment will be underestimated when the exchange rate is overvalued. Guyana maintained a fixed exchange rate regime, which did not reflect the true cost of foreign exchange, for a substantial period over the time of analysis. Despite these potential problems econometric analysis of saving behaviour need not yield misleading results, provided the data biases are constant over time and the errors are random.

4. The Estimation Methodology

There are three main aspects of the estimation strategy adopted in this paper. The first includes the determination of the order of integration of the variables in the saving function. This essentially involves the use of the Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) tests to establish the number of differencing required until each variable becomes stationary. Once the order of integration is established, the second aspect deals with the estimation of the long-run co-integrating saving regression. As there are seven hypothesised variables there may exist more than one cointegrating vector, thus the Johansen test for cointegration is used (Table 2). Co-integration among the variables implies that the saving function can be modelled by the error correction formulation.[3] Thus the final aspect of the estimation procedure deals with the establishment of the error correction model (ECM) that best approximates the data generating process. The ECM is estimated within the context of the Hendry-type general-to-specific framework where both short-run and long-run parameters are estimated simultaneously.[4]

This model selection strategy usually starts with the estimation of an over-parameterised model, in this case, it contains the six regressors included in equation (1). In this instance an over-parameterised ECM of the second order is estimated and continually simplified via the imposition of restrictions on the original and each of the "nested" equations until the preferred empirical model is obtained. The simplification process is done in a systematic manner where each equation is subjected to a set of diagnostic tests for serial correlation, heteroskedasticity, normality and functional form. In addition, Wald tests are performed to ensure that the omitted variables do not exert any joint influence on domestic saving. T-tests and economic theory provide guidance as to which variable(s) should be eliminated in the simplification process. Finally, there is a detailed examination of the constancy of the parameter estimates over time by utilising the plot of recursive residuals and traditional Chow tests.

---

3 This is the outcome of the famous Granger representation theorem (Engel and Granger, 1987).

4 This approach is different from the Engel-Granger two-stage process. See Thomas (1997) for the application of ECMs within the general-to-specific framework.

Table 1
Testing for Unit Roots

Variable	*ADF*	*PP*	Feature
CI	-1.34	-0.42	(C, NT, 3; 3)
ΔCI	-3.39**	-4.21*	(C, NT, 3; 3)
FRI	-2.0	-1.66	(C, NT, 2; 3)
ΔFIR	-3.04**	-6.06*	(C, NT, 2; 3)
FS	-3.72*	-3.76*	(C, NT, 2; 3)
ΔFS	-8.38*	-8.34*	(C, NT, 2; 3)
GS	-3.43**	-4.21*	(C, NT, 3; 3)
ΔGS	-5.11*	-8.02*	(C, NT, 3; 3)
RI	-2.46	-2.31	(C, NT, 3; 3)
ΔRI	-3.71*	-3.77*	(C, NT, 3; 3)
SD	-2.0	-3.3***	(C, NT, 2; 3)
ΔSD	-4.72	-7.02	(C, NT, 2; 3)
Y	-1.86	-1.66	(C, NT, 3; 3)
ΔY	-3.41**	-5.51*	(C, NT, 3; 3)

Notes:
1. Optimal lag lengths are determined by AIC and considerations to make the residuals white noise.
2. Trend Term included only if significant at 5 percent level.
3. *Significance at 1 percent, **significance at 5 percent, ***significance at 10 percent.
4. In features column *C* = constant, *NT* = no trend. First number in bracket = number of lags for *ADF* test, while second number = number of lags for *PP* test.

4.1 Determining the Order of Integration

Test statistics were calculated to indicate the order of integration for each of the univariate time series – saving, real interest, income, foreign saving, financial development proxy, government saving and credit to individuals. The results of the unit root tests, based on a unit root null hypothesis versus a stationary alternative, are reported in Table 1.

Overall the *ADF* and *PP* tests suggest that the variables, except *GS* and *FS*, are $I(1)$, meaning they become stationary after differencing once. *GS* and *FS* were found to be stationary in their levels. The *PP* test seems to suggest that at the 10% level, the *SD* is stationary in its levels. However, visual examination of the autocorrelation and partial autocorrelation functions suggests long memory

in the level of *SD,* thereby suggesting it is not stationary in levels. It should be noted, however, that the *ADF* test reports conclusively that *SD* is non-stationary in levels.

4.2 Searching for Long-run Relationship

In this section the cointegration properties of the data are investigated, making use of the Johansen procedure. The model includes a constant and allows for a linear trend in the variables but not in the cointegration relationship. Table 2 below reports that no systematic cointegrating vector can be found from the data. It should be noted that since *GS* and *FS* are stationary in levels they were omitted from the cointegrating vector.

Table 2
Johansen Test for Cointegration

H_0: rank = r	Eigenvalue	Trace Statistic	5 Percent Critical Values
r = 0	0.605	66.13	68.52
r ≤ 1	0.503	36.42	47.21
r ≤ 2	0.204	14.05	29.68
r ≤ 3	0.189	6.74	15.41
r ≤ 4	0.001	0.03	3.76

4.3 Estimating the ECM and Mis-specification Testing

At this stage the ECM can be estimated only in first differences since we could not obtain a cointegrating vector. However, we wish to still proceed by using the methodology of Thomas (1997) where short-run and long-run coefficients are estimated simultaneously in the regression. Following Hendry's methodology, Model I represents the initially over-parameterised equation containing the variables from the co-integrating equation (1) and lags up to the second order (Table 3). This model passes the diagnostic tests, as is evident immediately from inspection of the p-values of the test statistics for serial correlation, normality and functional form. Five variables – *ΔRI(-1), ΔY(-1), ΔFIR, ΔGS(-1)* and *ΔCI* – were omitted from Model I because of their insignificance as can be seen by inspection of the respective t-values. The Wald test reveals that the omitted variables had no joint significant influence on domestic saving. This first line of simplification results in Model II. The p-values and test statistics reveal that the model passes all the different diagnostic tests. Three more variables were excluded because of their individual insignificance and joint insignificance.

Table3
Regression Results
Dependent Variable: DSD

Regressors	Model 1	Model II	Model III
Constant	-209.7 (-2.41)**	-171.9 (-2.53)**	-156.3 (-2.38)**
ΔSD (-1)	0.483 (2.36)**	0.429 (2.92)*	0.468 (3.31)*
ΔRI	1.331(1.31)	2.118 (2.80)*	1.91 (2.66)*
ΔRI (-1)	1.189 (0.88)	-	-
ΔY	0.483 (5.02)*	0.445 (6.07)*	0.419 (6.36)*
ΔY (-1)	-0.214 (-1.69)	-	-
ΔFS	-0.612 (-3.36)*	-0.625 (-6.19)*	-0.578 (-6.94)*
ΔFS (-1)	0.256 (2.31)**	0.253 (2.37)**	0.278.77)**
ΔFIR	0.958 (0.558)	-	-
ΔFIR (-1)	-5.376 (-3.26)*	-3.258 (-3.00)*	-2.846 (-3.47)*
ΔGS	-0.082 (-0.71)	-0.099 (-1.29)	-
ΔGS (-1)	-0.002 (-0.01)	-	-
ΔCI	-0.566 (-0.40)	-	-
ΔCI (-1)	1.389 (1.12)	1.057 (1.04)	-
SD (-1)	-0.991 (-3.97)*	-0.986 (-5.51)*	-0.990 (-5.67)*
RI (-1)	-0.029 (-0.02)	-0.049 (-0.08)	-
Y (-1)	0.379 (3.94)*	0.338 (5.20)*	0.334 (5.20)*
FS (-1)	-0.687 (-2.87)**	-0.638 (-5.49)*	-0.603 (-5.69)*
FIR (-1)	2.793 (2.47)**	2.366 (3.25)*	2.054 (3.02)*
GS (-1)	-0.174 (-1.09)	-0.234 (-2.99)**	-0.185 (-2.67)**
CI (-1)	-1.456 (-1.87)***	-1.159 (-2.18)*	-0.935 (-1.936)***
AdjR^2	0.919	0.920	0.922
Normality (J-B, c^2 (2))	2.13 [0.345]	0.20 [0.903]	0.01 [0.997]
Serial Correlation (LM (2))	0.35 [0.841]	0.80 [0.669]	0.73 [0.696]
Heteroskedasticity (White's test)	-	30.9 [0.418]	25.4 [0.385]
Wald Test (F-stat)	0.95 [0.485]	0.87 [0.474]	-
Ramsey RESET (F-stat)	0.48 [0.707]	0.49 [0.692]	0.31 [0.815]
Chow's Breakpoint Test (1985)	-	-	1.13 [0.454]
Chow's Forecast Test (1991-1992)	-	-	0.49 [0.837]

(.) Contains t-ratios;
[.] contains p-values;
* Indicates significance at the 1 percent level;
** indicates significance at the 5 percent levels;
*** Indicates significance at the 10 percent level.

Model III represents the final and preferred saving model for Guyana. The diagnostic tests suggest that this equation is well specified on statistical grounds. The Lagrange Multiplier test for second order serial correlation of the residuals does not reveal this problem. In light of the Jarque-Bera test, the null hypothesis of normality cannot be rejected. White's test could not reject the null hypothesis of homoskedasticity, thus indicating that the errors of the model have a constant variance. Furthermore, Ramsey's RESET test for general misspecification could not reject the null hypothesis of correct specification – suggesting that Model III is constructed in its correct functional form and does not omit relevant variables.

The various tests for parameter stability reveal that the estimated coefficients are stable over time. Appendix I (Figure 1) presents the plot of recursive residuals about the zero line for the final model. Residuals outside the standard error range (plus and minus 2 S.E.) suggest instability in the parameters of the equation. As can be seen from the graph, there is no reason to suggest parameter instability. Chow's breakpoint test was used to determine whether the parameters were constant for two sub periods – 1965 to 1984 and 1985 to 1999. The test gives a computed F-value of 1.13 or a p-value of 0.454, thereby confirming the reliability of the estimated coefficients.

To establish whether the Economic Recovery Programme, which was introduced at the end of 1988, had an impact on the stability of the model, Chow's forecast test was computed to determine the ability of the model to predict values over the period 1992 to 1999. It does so successfully, as is revealed by the calculated F-value of 0.49 and the corresponding p-value of 0.837. All the variables in the final model are statistically significant, at least at the 10 percent level. Finally, adjusted R^2 shows that the hypothesised determinants of saving are able to explain 92.2 percent of the variation in *SD*. Appendix I (Figure 2) implies that the empirical model is fairly well-behaved since the fitted values track the actual values closely. The residual plot of Model III is also stable within the specified band.

4.4 Analysis of Estimation Results

An analysis is now presented of the regression results for the long-run and short-run coefficients (see Table 4). In the short-run the saving and real interest rate relationship is positive, while in the long-run there is no significant coefficient to suggest that real interest is a determinant of *SD*. For the income variable the estimated long-run and short-run coefficients are positive, which accords with most of the studies in developing countries. The long-run coefficient amounts to a value of 0.337, representing the marginal propensity to save.

Table 4
Long-run and Short-run Coefficients

	Short-run	Long-run
RI	1.907	-
Y	0.419	0.337
FS	-0.578	-0.609
FIR	-2.845	2.075
GS	-	-0.187
CI	-	-0.944

The coefficient of foreign saving is negative in both the short and long-run, thereby signalling the existence of an externally induced liquidity constraint. This relation, however, is less than one-to-one: a one-unit inflow of foreign capital will reduce domestic saving levels by just over 60 percent of the inflow in the long-run. The financial development proxy exerts a negative impact on *SD* in the short-run, also signalling the existence of a liquidity constraint, though this time from a different source. However, the long-run relationship is positive and suggests that deepening the financial system will enhance domestic saving levels. Government saving impacts negatively on saving levels in the long-run. However, the coefficient of –0.187 is far less than the one-to-one crowding out predicted by the classical Ricardian equivalence hypothesis. The strong negative relationship between *SD* and *CI* signals once again the existence of liquidity constraints. This is in no way strange for low-income countries like Guyana. Finally, the coefficient on the disequilibrium error is –0.99, implying that 99 percent of any disequilibrium between actual and equilibrium saving in any one period is made up within the next period.

5. Conclusion

This paper sought to explain the determinants of domestic saving in Guyana in light of the theoretical literature on saving behaviour and contemporary econometric tools. The study found that domestic saving is influenced by real deposit interest rate (only in short-run), income, foreign saving, financial development, government saving and credit to individuals. Failure to detect a significant long-run relationship between saving and real interest rate is not strange, given the low level of economic development, low per capita income, the underdevelopment of financial markets, and the existence of liquidity constraints. Positive changes in income levels seem to be the surest way to augment saving levels since saving and income are positively related in both the short and long-run. Long periods of lukewarm economic growth, which Guyana is currently experiencing, will stymie the process of saving mobilisation. The coefficient of the financial development variable supports the view that modernising the

financial system will have a beneficial effect on the mobilisation of domestic saving. Financial deepening will likely enhance the role of private capital ownership, diversify the menu of financial instruments available to Guyanese, and encourage of the mobilisation of saving through the issuance of new equity rather than over reliance on debt financing.

Foreign saving and domestic saving are substitutes in the short and long-run. This outcome highlights how important it is for policy makers to focus their mobilisation efforts within Guyana rather than concentrate overwhelmingly on foreign aid, debt relief and external borrowing. The possible existence of liquidity constraints in the short and long-run means that the relaxation of domestic credit or increase in money supply over desired holdings of money balances would increase consumption and thus reduce saving levels. The government will have to take a close look at easy credit, especially as it relates to consumption of consumer items (especially of imported origin). Finally, the study also shows that government saving can adversely affect domestic saving and thus private saving levels.

References

Bandiera, O., G. Capiro, P. Hanohan and F. Schiantarelli. 2000. "Does Financial Reform Raise or Reduce Saving?" *The Review of Economics and Statistics* 82, No.2: 239-263.

Bank of Guyana. various years. *Statistical Bulletin.* Georgetown: Bank of Guyana.

Edwards, S. 1996. "Why are Latin America's Savings Rates so Low? An International Comparative Analysis." *Journal of Development Economics* 51: 5-44.

Engel, R. and C. Granger. 1987. "Co-integration and Error Correction: Interpretation, Estimation and Testing."*Econometrica* 66: 251-276.

Fry, M. 1978. "Money and Capital or Financial Deepening in Economic Development?" *Journal of Money, Credit and Banking* 10, No.4: 464-475.

Fry, M. 1995. *Money, Interest and Banking in Economic Development* (2nd edition). London: Johns Hopkins University Press.

Ganga, G.N. 1995. "Interest Rates, Savings and Investment in Guyana, 1965-1990." *Transition* 24: 75-87.

Gibson, H. and E. Tsakalotos. 1994. "Scope and Limits of Financial Liberalisation in Developing Countries: A Critical Survey." *Journal of Development Studies* 30, No.3: 578-628.

Giovannini, A. 1983. "The Interest Elasticity of Savings in Developing Countries: The Existing Evidence." *World Development* 11, No.7: 601-607.

Giovannini, A. 1985. "Saving and the Real Interest Rate in LDCs." *Journal of Development Economics* 18: 197-217.

Griffin, K. 1970. "Foreign Capital, Domestic Savings and Economic Development." *Bulletin of Oxford University Institute of Economics and Statistics* 32: 99-112

Gupta, K. 1984. *Finance and Economic Growth in Developing Countries.* London: Croom Helm.

Gupta, K. 1987. " Aggregate Savings, Financial Intermediation and Interest Rate." *Review of Economics and Statistics* 69, No.2: 303-311.

Harris, R.I.D. 1995. *Using Cointegration Analysis in Econometric Modelling.* London: Prentice Hall-Harvester Wheatsheaf.

IMF. various years. *International Financial Statistics.* Washington, DC: International Monetary Fund.

IMF. 1993. *World Economic Outlook.* Washington, DC: International Monetary Fund.

Mavrotas, G. and R. Kelly. 1999. "Financial Sector Development and Savings Mobilisation." *Working Paper 10*, Finance and Development Research Programme: University of Manchester.

Mikesell, R. and J. Zinser. 1973. "The Nature of the Saving Function in Developing Countries: A Survey of the Theoretical and Empirical Literature." *Journal of Economic Literature* 11:1-26.

Ogaki, M., J. Ostry and C. Reinhart. 1996. "Saving Behaviour in Low and Middle Income Developing Countries." *IMF Staff Papers* 43, No1: 38-71.

Patterson, P. 2000. *An Introduction to Applied Econometrics: A Time Series Approach.* New York: Palgrave.

Schmidt-Hebbel, K., S. Webb and G. Corsetti. 1992. "Household Saving in Developing Countries: First Cross – Country Evidence." *World Bank Economic Review* 8, No. 3: 529-542.

Thomas, R.L. 1997. *Modern Econometrics: An Introduction.* New York: Addison-Wesley Longman Ltd.

Warman, F. and A. Thirlwall. 1994. "Interest Rates, Saving, Investment and Growth in Mexico, 1960-1990: Tests of the Financial Liberalisation Hypothesis." *Journal of Development Studies* 30, No. 3: 629-649.

Watson, P. and C. Ramlogan. 1991. "Saving and the Rate of Interest in Trinidad and Tobago: An Empirical Analysis." *Savings and Development* 15, No.4: 349-359.

White, H. 1992. "What do we know about Aid's Macroeconomic Impact? An Overview of the Aid Effectiveness Debate." *Journal of International Development* 4, Special Issue: 121-137.

Wood, A. 1995. "Determinants of Private Savings in Barbados." *Savings and Development* 19, No.1: 79-94.

Appendix 1

Figure 1
Plot of Recursive Residuals

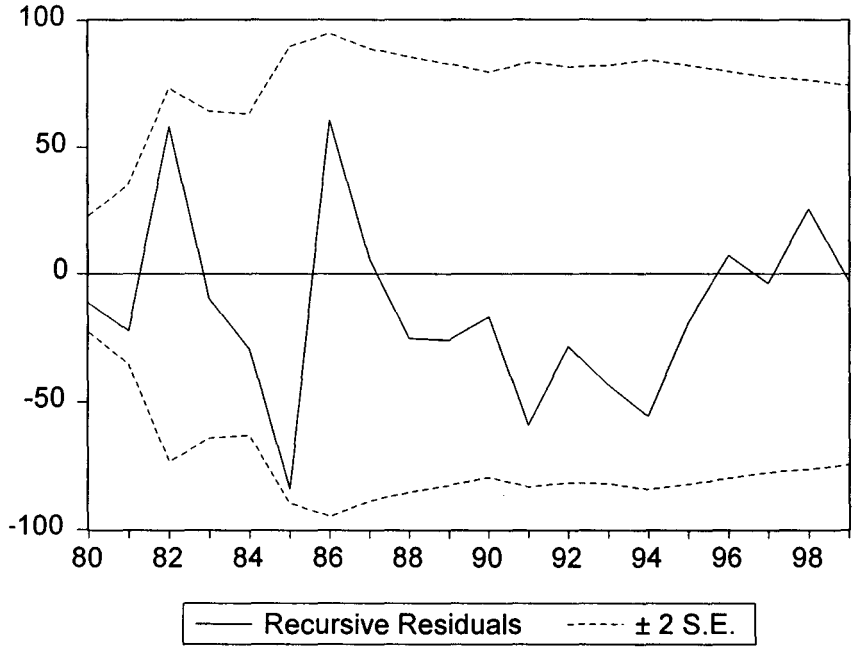
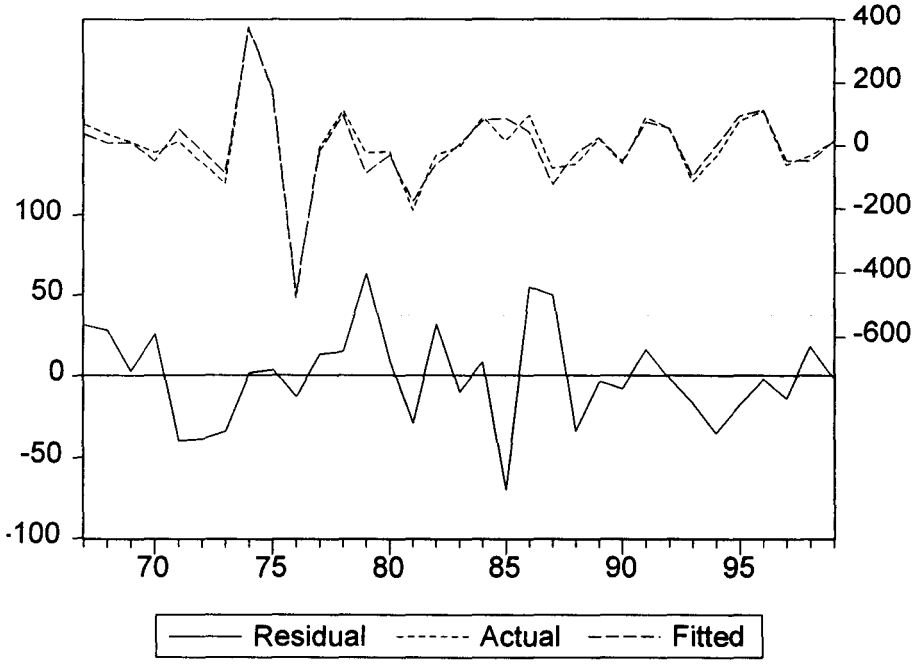


Figure 2
Plot of Actual and Fitted Values and Residual Plot for ECM III



9

Tax Reform and Financial Development in Trinidad and Tobago

Dave Seerattan

Abstract

This paper seeks to assess the impact of the introduction and subsequent removal of tax incentives for savings, on the development of the financial sector in Trinidad and Tobago. The analysis utilizes a multivariate statistical technique, the analysis of variance method (ANOVA), to determine whether there are significant differences between growth rates of institutions which were eligible for the incentives and those which were not. The results suggest that tax incentives promoted faster growth in the tax-favoured institution under study (the Unit Trust Corporation). Moreover, the tax incentives had the greatest impact on the growth of the tax-favoured institution during the first three years of its existence. Thereafter, the growth impact lessened considerably as other competing financial products entered the market. Tax incentives in the financial sector, therefore, seem to be effective only in the short-term. In the medium to long term, however, they are likely to result only in lower tax revenues to the fiscal authorities.

1. Introduction

The development and efficiency of the financial system are almost universally accepted as having a positive impact on economic development (Beck, Demirguc-Kunt and Levine (1999); Beck, Levine and Loayza (2000); King and Levine (1993) Levine (1999); Levine, Loayza and Beck (2000); Pagano (1993) and Modeste (1996). The gross stock of financial assets (savings) and the range of financial assets available appear to have a positive causal relationship to economic growth and development (Fry (1995)). The efficiency of financial intermediation is also a key factor in the growth process, quite apart from the aggregate level of financial services provided. Any factor which impedes this efficiency, therefore, also has negative implications for growth.

Taxes affect the efficiency of the financial sector by imposing a wedge between the return to savers and the return on the investments which are eventually financed by these savings (Tanzi and King (1995)). This wedge is created by taxes on a range of activities by individuals and institutions in the course of transacting

business in the financial sector. Taxes in the financial sector are also pervasive, with taxes imposed on the full range of transactions including the purchase of assets, the holding of assets, the income and capital gains from assets and the sale of assets. The system of taxation for the financial sector also covers the full range of sub-sectors, with the imposition of taxes in areas as diverse as banking, insurance, mutual funds, stock markets, credit unions and government securities. In spite of this, analyses of the financial sector are often done without reference to the impact of taxation on the performance and effectiveness of this sector.

The taxation of this sector deserves special treatment because it provides an unusual variety of avenues for the imposition of taxation for revenue generation. These avenues are, in most cases, fully exploited by governments, especially by authorities in developing countries where the tax base is limited. Last, but by no means least, is the fact that this market is prone to market failures, some of which can be ameliorated by "corrective" taxes. The taxation system can affect the development of the financial sector through its impact on the aggregate level of savings (Auerbach and Kotlikoff (1981), Boskin (1976), Smith (1990) and Bernheim (1999)). It can also affect the portfolio composition of economic agents (Poterba (2001)) and corporate financing decisions (Auerbach (2001), Haugen and Senbet (1986) and Gertler and Hubbard (1993)).

The development of an appropriate taxation regime for the financial sector is, therefore, very important to the development and growth of this sector. An appropriate taxation system should attempt to correct known distortions (asymmetric information), minimise the distortions created for a given revenue yield and avoid pushing tax revenues collected from this sector beyond the point where the marginal cost of collecting these funds exceeds those elsewhere in the economy.

In Trinidad and Tobago, tax policy for the financial sector before the 1990s was driven in many instances by a supply-side orientation. That is, tax policy for this sector focused on incentives to increase savings in general and to encourage the use of certain instruments and institutions as the preferred vehicles for savings. These policies were part of an overall thrust to deepen and widen the financial markets, as policy makers saw the development of this sector as a key factor in the growth and development of the economy. Subsequent tax reform efforts in the post 1990 era, however, saw the dismantling of these incentives as tax policy now focused on administrative efficiency and revenue yield.

These developments have had an important impact on the way in which the financial sector has developed. There is, however, virtually no research done in this area. This paper attempts to help fill this gap by evaluating the impact of tax policy on the development of the financial sector. Specifically, this paper seeks to evaluate whether the provision and subsequent removal of tax incentives impacted on the mobilisation of savings and/or the distribution of savings in instruments that attracted preferential tax treatment. These issues have implications not only for the size of the market (i.e. overall financial savings) but also for the structure of the financial sector in terms of the variety of instruments and institutions. In short, these issues directly impact on the development of the sector.

This paper is structured as follows. Section 2 reviews some of the theoretical issues relevant to tax policy for the financial sector, especially the provision of

tax incentives for savings. Section 3 evaluates the changing structure of the taxation regime for the financial sector in Trinidad and Tobago. Section 4 attempts to evaluate how the regime shift has impacted on the development of the financial sector in Trinidad and Tobago and the effectiveness of the tax incentives. Section 5 concludes by attempting to distil some policy implications for the development of an appropriate tax regime for the financial sector.

2. Tax Incentives for Financial Savings: Theoretical Issues

Economic agents will allocate funds to those financial assets that yield the highest risk-adjusted, real after-tax rate of return (Poterba (2001)). There is therefore a reasonable level of agreement that tax incentives to save affect the composition of savings or the portfolio composition of savers. There is, however, little agreement on the impact of saving incentives on the level of savings (Besley and Meghir (1998)). This controversy is driven by the ambiguity of the theoretical literature on the impact of taxation on the level of savings.

This ambiguity hinges on the problems associated with determining the magnitude and direction of the interest elasticity of savings. The theoretical work in this area is centred on the Life Cycle Hypothesis (LCH) and variants thereof. This model is used to analyse inter-temporal optimization issues and is therefore useful for considering the impact of tax incentives on savings (Bernheim (1999), Besley and Meghir (1998)). The Life Cycle Hypothesis (LCH) basically argues that the level of savings can be influenced by adjusting the real after-tax rate of return. The tax regime for savings, therefore, could have a direct impact on the level of savings. The strength and direction of this effect are determined by the interest elasticity of saving. This elasticity can, in theory, be either positive or negative, depending on whether the substitution or income effects dominate.

In particular, a higher after-tax rate of return (lower tax) is equivalent to a reduction in the price of future consumption, which causes economic agents to substitute future consumption (savings) for present consumption (substitution effect). The associated increase in income tends to increase consumption, thus reducing the level of savings (Income effect). The income and substitution effects work in opposite directions and there is no presumption about which effect dominates. This theoretical ambiguity is compounded by the fact that the empirical evidence is mixed. If the substitution effect dominates then savings should increase. This increases the importance and the significance of the interest elasticity of savings, which is the mechanism through which the substitution effect operates.

Work by Boskins (1978), Summers (1981) and Makin (1987) generated interest elasticity estimates which were between 0.3 and 0.4 for the United States. On the other end of the spectrum, Beach, Boadway and Bruce (1988) found an interest elasticity which was insignificant for Canada. Howrey and Hymans (1978) and Friend and Hasbrouck (1983) also found that the real after-tax rate of return had little or no effect on the level of savings. The results from studies by Montgomery (1986) and Baum (1988) reinforced this conclusion. There has been considerable debate as to the reasons for the mixed results. These centre mostly on the measurement of the real (inflation adjusted) after-tax rate of return, the fact that in most studies the tax effect is inferred from the interest rate effect rather

than from direct tests of the tax effect and the relevance of the particular interest rate chosen (Sandmo (1985)).

The literature on savings in the Caribbean is similarly pessimistic about the significance of the interest elasticity of savings. Studies on savings in Trinidad and Tobago by Bourne (1988), Ramsaran (1988) and Ekanayake (1991) showed the interest rate as being an insignificant determinant of savings. The study by Watson and Ramlogan (1991) is the only one which found a positive and significant interest rate effect but only in the long run, while Craigwell and Rock (1990) found a negative relationship between the interest rate and savings. In Trinidad and Tobago, the reason for this weak or non-existent relationship is thought to be the underdeveloped nature of the financial market, the fact that interest rates were regulated for a significant part of the period under review and the low risk tolerance of economic agents. All the evidence seems therefore to indicate that the interest elasticity of savings in Trinidad and Tobago is unlikely to be positive and significant and tax policies which seek to lower the real after-tax rate of return would not have a significant positive impact on the level of savings.

The literature on the impact of tax incentives on the composition of savings is much clearer. It is generally agreed that economic agents substitute tax-preferred instruments for taxed alternatives (Auerbach and Slemrod (1997), Hubbard and Skinner (1996), Poterba, Venti and Wise (1996), Engen, Gale and Scholz (1996) and Venti and Wise (1990)). In spite of this, relatively few studies have found an unambiguous relationship between taxation and portfolio behaviour. This is because differences in the real impact of taxation often result from differences in individuals' wealth and income circumstances. When these characteristics drive differences in the real effective marginal tax rates, the isolation of the pure tax effects on portfolio structure is difficult.

Research by Venti and Wise (1990) and Engen, Gale and Scholz (1996) are of particular interest because they explore the issue in the proper context. That is, whether tax incentives raise the aggregate level of savings, whether they only raise savings in the tax favoured assets at the expense of the taxed alternatives or whether they have no impact at all. Unfortunately, these studies rely on household level data which are not available in Trinidad and Tobago.

The issue of how tax incentives affect portfolio composition can be best understood in the context of the theory of portfolio choice using the Capital Asset Pricing Model (CAPM). This can be done by re-defining the returns and covariances of the CAPM model in after-tax terms. A number of studies have considered the tax consequences for investors in this framework (Auerbach and King (1983), Elton and Gruber (1978), Long (1977) and Talmor (1985)).

These studies generally assume that there are two assets, a taxed and a non-taxed alternative, but it is relatively easy to generalise the analysis for a broader range of assets. Actual asset markets have a range of risky securities which are taxed at different rates. The pre-tax returns on these assets are imperfectly correlated so investors must choose assets based on their risk as well as their tax characteristics. The findings of these studies can be easily summarised with the use of notation as developed in Poterba (2001).

Let W_o denote a household's initial wealth, Ei the household's investment in risky asset i and assume that the riskless rate of return r_f is taxed at a rate t_f, while risky assets are taxed at the rate t_r (this can be generalised to the case of

different tax rates on different risky securities). The pre-tax returns on the risky securities are given by r_i where $i = 1,..., N$. The expected pre-tax return on risky securities i is μ_i and the vector of mean returns on securities $\{r_1 ..., r_N\}$ is μ while Σ denotes the *N-by-N* covariance matrix of risky returns. The covariance between the pre-tax return on risky assets i and j is σ_{ij}.

Investors are assumed to maximise a utility function that can be written in terms of the mean and variance of final wealth $U(W, \sigma^2_W)$. Using this notation to define investors' expected end-of-period wealth, and variance, as a function of the return generating parameters, and the amounts invested in each security, and substituting into the utility function , yield the function to be optimised:

1. $$U([W_0 - \Sigma E_i](1-t_f)r_f + \Sigma E_i(1-t_r)r_i, \Sigma E_i E_i(1-t_r)2\sigma_{ij})$$

The first order condition for the optimal asset holding of risky asset i is given by:

2. $$U_w * [-(1-t_r)r_f + (1-t_r)r_i] + 2 * U_\sigma{}^2 * (1-t_r)^2 * \sum_j * \sigma_{ij} = 0$$

If we define $$\delta = \frac{Uw}{2 * U_{\sigma 2} * (1-tr)2}$$

Then the first order condition for optimal asset holding can be written as:

3. $$\delta * [-(1-t_f)r_f + (1-t_r)r_i] = \sum_j j * \sigma_{ij}$$

This expression can be written in matrix notation, using $E=\{E_1,....,E_N\}$ as a column vector and λ as a column vector of ones, as:

4. $$\delta(1-tr)\mu - \delta(1-tf)rf\lambda = \Sigma E$$

The optimal holdings of risky assets would then be

5. $$E^* = \delta * \Sigma^{-1} * [(1-t_r)\mu - (1-tf)rf * \lambda]$$

In the special case of no tax on the returns of either risky or risk-free assets, the expression simplifies to:

6. $$E^* = \delta * \Sigma^{-1} * \mu - r_f * \lambda, \quad where \delta = U_w / 2U_\sigma{}^2$$

When returns are taxed the optimal portfolio can be thought of as a weighted combination of two portfolios, one optimised on tax considerations and the other optimised on risk considerations. The relative share of these two portfolios depends on investors' relative tax rates and investors' appetite for risks, that is, investors with low risk tolerance would generally choose a portfolio that is mostly based on risk diversification considerations and less on tax minimisation considerations.

There is, however, a growing understanding that the asset allocation problem is much more complex in the presence of taxes. The difficulties inherent in defining and measuring investors' risk averseness and relative tax rates complicate this analysis. One also needs to incorporate the impact of market imperfection such as short selling limits and transaction costs (Basak and Gallmeyer (1998)) to determine analytically how taxes are likely to impact on investors' asset allocation decisions.

If tax-favoured assets have relatively similar risk/return characteristics as taxed alternatives and if the transaction costs are also relatively similar, it is likely that investors would increase the holdings of tax-favoured assets relative to taxed alternatives. This is even more likely when the tax-favoured assets did not previously occupy a significant share of the investor's portfolio such as assets that are new to the market and therefore have great scope for risk diversification.

The problem remains, however, that information is not available in a sufficiently disaggregated format which would allow the type of analysis required to test tax-based theories of portfolio choice. Specifically, much of the data needs to be collected at the level of the individual, taking account of the full range of assets in which investors may choose to invest. One way forward is to evaluate the time series changes that have occurred in tax-favoured and taxed savings instruments to determine whether they track closely major tax reforms which would have altered their real after-tax rate of return. Samwick (2000) has adopted this general approach but at the household level.

Another theoretical issue that must be considered in the design of tax policy for the financial sector is the issue of efficiency and excess burden (deadweight loss) generated by particular tax measures. Tax policy in this sector must attempt to keep distortions to a minimum, subject to the restrictions flowing from the need to raise revenue and maintain an equitable tax burden.

This issue of excess burden or efficiency loss is also linked to the optimal taxation issue. The central issue in the theory of optimal commodity taxation is determining the structure of taxes on various commodities to raise a given amount of tax revenue with a minimum of the tax-induced efficiency loss described above. The solution to this problem is summarised in a number of tax rules, the validity of which depends on assumptions regarding the feasible scope of taxation and the nature of the consumer demand function for these commodities. Three of these rules have implications for tax policy in the financial sector. These are the proportionality rule, the Ramsey rule and the inverse elasticity rule.

The proportionality rule argues that if all commodities are taxable, then the optimal structure would be one where the tax on each commodity is the same. The economic rationale behind this rule is easy to explain by reference to the discussion above on excess burden. The efficiency loss or excess burden is generated by tax-induced changes in the relative prices of commodities. If all

commodities are taxable and taxed at the same rate, relative prices do not change and therefore no efficiency loss can arise. Since taxing all commodities equally seems to be the simplest tax regime which can be implemented, the proportionality rule at first glance seems to be the best combination of theoretical optimality and administrative simplicity. This is, however, not the case. The optimality of the proportionality rule depends on the government's ability to tax all commodities equally, and since this is seldom possible in a realistic policy environment where information asymmetries are a problem, tax policy based on this rule might be difficult to implement.

Equity considerations would also argue against a tax policy based on this rule. Additionally, this analysis abstracts from the issue of tax incidence under different market structures. The excess burden of a tax would be affected by the market structure in the sense that in some structures, producers would pass on the tax to the consumer while in other structures they might absorb the tax-induced price change. More importantly, in cases where markets are far removed from full efficiency, that is, where there are many structural features which distort the behaviour of economic agents and increase transaction costs, there might be instances in which the imposition of a tax might improve welfare (Stiglitz 1991). This is an argument which has been advanced in the case of reserve requirements and taxes on short-term capital flows.

The Ramsey rule argues that for a tax structure to be optimal, the proportional tax-induced reduction in the quantities demanded of a taxed commodity (as measured along its compensated demand curve) should be the same for all taxable commodities. This rule emphasises changes in quantities, not relative prices, since relative price changes are only the means through which the quantity changes are effected. The Ramsey rule is also stated in terms of compensated demand curves and measures of excess burden under this framework are based on Hicksian measures and not on the Dupuit-Marshall-Harberger measure used above.

This rule operates by reducing the sum of the excess burden across commodities by changing the tax rate on individual commodities. This causes the increase in excess burden, occasioned by an increase in the tax on one commodity, to be more than offset by a decline in the excess burden from a reduction in the tax rate on another commodity. No further reduction in excess burden would be possible when the point is reached where changes to tax rates produce equal changes in compensated demand across all commodities. At this point the tax structure is considered optimal. This implies that an optimal tax structure under this framework would invariably be comprised of different tax rates on different products. The weakness of this framework is that the compensated demand functions are not directly observable, so for all practical purposes, tax policy based on this framework would be difficult to implement.

The inverse elasticity rule states that the optimal tax rates for commodities are inversely related to their own-price elasticity of demand. This rule argues that tax-induced efficiency losses would be lower if the authorities apply relatively higher tax rates on those financial assets which are relatively price inelastic, and relatively low rates on those products which exhibit high price elasticities of demand. This abstracts from the issue of equity. This rule depends, however, on the assumption that the demand for each taxed commodity is independent of all

commodity prices except its own. This assumption is unrealistic, especially in the financial system where financial assets have close substitutes and price changes in one product invariably affect the demand for close substitutes.

Some of the main guidelines for tax policy emanating from the above analysis are outlined below.

(i) Taxation imposes an efficiency cost on agents, the size of which varies positively with the price elasticity of demand of products in the pre-tax situation and the square of the tax rate itself.

(ii) The efficiency loss from taxation is more onerous in cases where the price elasticity of demand is relatively higher, therefore tax policy should, in principle, impose relatively lower tax rates on products which have high elasticities. In most cases this is relevant in markets where there are many close substitutes for the products to be taxed and therefore many opportunities for tax arbitrage.[1]

(iii) Taxes impose costs on consumers and the authorities must always be cognizant of the need to minimise these costs in their efforts to achieve particular objectives in terms of tax revenue yield.

(iv) A policy which taxes various products at rates which are broadly similar, especially in product markets where there are close substitutes, seems the best way to minimise distortions and still meet the need to raise revenue.

In cases where there are imperfect markets and/or when conditions are far removed from full efficiency, the standard approaches to excess burden and optimal tax system might not be applicable. In particular, when markets already face many distortions and structural weaknesses, the imposition of specific taxes might actually improve welfare.

Based on this there seems to be a variety of effects that taxes have when imposed on the financial system. These include:

1. The reduction in the level of financial assets in the formal financial sector, as funds flow to the low-tax sub-sectors (informal and foreign sectors) through tax arbitrage. At the level of institutions and assets, this phenomenon of arbitrage also comes into play when investors place their funds in institutions and assets that attract lower taxes. The tax system therefore has an important impact on portfolio selection and the choice of financial institutions through which people save and invest.

---

1 Tax arbitrage is a process where economic agents avoid products, institutions and markets which are subject to relatively higher taxes, for alternatives which attract relatively lower rates of taxation, to minimise their net tax burden and improve their welfare.

2. Taxation can also impact on the distribution of savings in both the household and corporate sectors. Among households, it impacts on the portfolio composition as well as their preference for current consumption *vis-a-vis* savings. Among corporations, it affects their corporate financing decisions, especially their predisposition to use debt relative to equity finance.

3. Taxes interact with existing imperfections in financial markets, sometimes accentuating these distortions, but sometimes helping to ameliorate them.

4. Taxes can also impact on the level of savings and the inter-temporal allocation of resources. This effect is quite different because it operates through the relationship between capital accumulation and growth. This is very controversial because the analysis hinges on the impact of the interest elasticity of savings on capital accumulation.

In this paper, we concentrate on (1) above, that is, the impact of taxes on portfolio composition and the choice of financial institutions through which agents save and invest.

The review of the theoretical issues surrounding taxation, especially as they refer to efficiency and the pattern of demand, has highlighted some policy concerns of relevance to the taxation of the financial sector. In particular, tax arbitrage and its impact on portfolio composition and the choice of institutions and market through which agents save and invest are especially important issues for the financial sector. The effectiveness of tax incentives in the financial sector rests on their ability to increase aggregate savings or, at the very least, raise the level of savings in the tax-favoured asset/institution, possibly at the expense of taxed alternatives.

This is the primary issue explored in this paper. This sort of microeconomic issue is often not aired in a sufficiently comprehensive manner because information is usually not available at the individual or household level, which is required to execute microeconomic research. We face this constraint in our efforts to explore the real impact of tax incentives in the financial sector. To get some idea of the real impact of tax incentives we use a method analogous to Samwick (2000). That is, we compare the growth of assets/institutions across periods when tax incentives were actively used with those years when tax incentives were not used, to determine whether tax-favoured assets/institutions grew faster than their taxed counterparts in the period when tax incentives were in force. In effect, we would be testing whether there is a significant difference between the taxed and tax-favoured alternatives during the period of the tax incentive policy regime, as well as testing whether the growth in tax-favoured institutions is significantly higher in the tax incentive regime period. We now turn to a review of the taxation of the financial sector and an evaluation of how this has impacted on the development of this sector.

3. Tax Policy and the Development of the Financial Sector in Trinidad and Tobago

Financial innovation in Trinidad and Tobago has generated a significant increase in the variety of financial instruments (Zephirin and Seerattan 1997). Financial assets are often purchased and held directly by individuals but indirect holdings through banks and other financial institutions have become more important. This has occurred as economic agents have become more sophisticated and their changing risk/return preferences have led them into other financial assets and away from traditional bank deposits. Partly as a result of this trend, it has become increasingly difficult to assess the overall impact of taxes in the financial sector. For example, taxes may be imposed on the costs of acquiring assets, on the holding of assets, the flow of income derived from financial assets and on the sale of these assets. These tax provisions generally differ, depending on whether the assets are held directly by individuals or indirectly through financial institutions.

To put these taxes into perspective, let us assume that an individual spends one unit of his own resources to acquire a financial asset at the beginning of the period, and disposes of the asset at the end of the period with its accumulated pre-tax returns P. The acquisition may be taxed at the rate t_a and/or attract a tax relief, t_r. The value of the asset acquired at the beginning of the period will therefore be $(1 - t_a)/(1 - t_r)$. If the holding of the asset is taxed at t_w, its income is taxed at t_y and its disposal taxed at t_d, then the after- tax return (R^t) on this asset for one period would be

$$R^t = [(1-t_w) + P(1-t_y)]*(1-t_a)*(1-t_d)/(1-t_r) \qquad (7)$$

We now turn to a review of development in the tax system for the financial sector in Trinidad and Tobago.

Tax policy in the financial sector in Trinidad and Tobago in the last two decades has evolved largely as a result of *ad hoc* changes designed to either raise revenue or facilitate development of particular sub-sectors in the system. The more organised tax reforms, which occurred between 1989 and 1996, attempted to dismantle the system of numerous allowances and replace these with a few tax credits. These reforms sought to rationalise and simplify the tax system mainly for administrative efficiency reasons and to remove tax elements, which gave some institutions and asset categories an advantage over others. In this section, we review the various changes that have been made over the last two decades and the impact of these changes on financial development.

Tax revenues derived from tax on incomes have dominated total tax revenues but tax reforms have increased the importance of indirect taxes on goods and services, the category of tax revenue in which taxes on the financial sector would normally be reflected. Taxes on this sector, mainly in the form now of withholding taxes, are easy to administer since they are collected at source, that is, at the financial institution level. This reduces opportunities for evasion since the authorities collect from a small number of financial institutions rather than from

large numbers of individuals, which reduces the opportunities for evasion, as well as compliance costs.

Tax policy in this sector in the pre-1990 period was characterised by a number of exemptions from taxes and instances where the holding of certain financial assets created opportunities for deductions against income tax. This was evident in the 1980s when the government was more proactive in its attempt to develop the financial sector. Since then the policy has emphasised simplicity, administrative efficiency and competitive neutrality.

In the 1980s, the most significant tax policy developments were those which gave certain asset categories and institutions tax-favoured status. This policy sought to create space for new and non-traditional assets and institutions and was aimed at widening and deepening the financial sector. The most important included the tax incentives granted to credit unions and Unit Trust members for increasing their investments in these institutions, this in an attempt to make these institutions more attractive to consumers *vis-a-vis* commercial banks. Credit unions had already benefited from the high rates of growth in the late 1970s and early 1980s and from exemption from corporate tax. This, together with the introduction of the tax deductibility of contributions in 1982, helped the credit unions to compete more effectively with commercial banks. These developments increased the level of competition in the sector and forced the banks to modify their strategies to meet the challenges from these institutions.

The other major development in the financial sector in the 1980s was the introduction of the Unit Trust Corporation in 1982. The Unit Trust was intended to provide the small investor with a vehicle to indirectly invest in the stock market while mitigating the risk of this type of investment. This was to be done through the pooling of risks and through the use of professional managers who were better equipped to deal with the complexity of the market. This institution was provided with an additional fillip of tax incentives. Specifically, this institution enjoyed a privileged tax status both at the corporate tax level and at the level of unit holders. The corporate income of the Unit Trust was completely tax-exempt while unit holders' income from the First Unit Scheme was tax-exempt up to a level of $5,000.

These incentives did not insulate the Unit Trust from difficulties. Sales in the First Unit Scheme which had opened strongly in 1982 with sales of $36 million dropped sharply to $3 million and $1.4 million in 1983 and 1984 respectively. The offer prices for units also declined from $10.1 to $6.3 between 1982 and 1985. These declines occurred as the economy slipped into a recession driven by falling oil prices. By 1986, the sale of units had recovered to $12.4 million due in large part to the introduction of tax incentives for the purchase of units in that year. In particular, in 1986 the purchase of units was now tax-deductible up to a limit of $2, 500 per annum. This was changed in 1989 to a system where a tax credit up to a maximum of $625 was provided for the purchase of units. The stimulus provided by this incentive together with the increase of the dividend income allowance (which helped to increase distributions) continued to boost sales in the scheme and the offer prices continued to recover in spite of continuing negative real growth rates in GDP (see Table 1).

Table 1
Selected Indicators of the Relative Development of Taxed and Tax Exempt Financial Institutions

Year	UTC Assets ($M)	UTC UTC Sales ($M)	1st Unit Distribu-tions ($M)	Commercial Scheme Offer Price ($)	Commercial Banks Assets ($M)	Net Bank Deposit ($M)	Real Interest Margin	GDP (%)
1982	42.1	35.9	-	10.1	8553.0	6613.5	-	4.0
1983	26.1	38.7	2.6	8.75	9607.6	7248.1	-	-9.2
1984	21.4	0.65	2.1	7.45	10059.8	7639.7	-	-6.2
1985	21.3	3.9	1.9	6.3	10165.1	7701.1	-	-4.1
1986	32.2	11.3	2.4	5.9	9913.2	7417.1	5.2	-3.3
1987	55.2	20.6	3.2	6.35	10744.4	7457.5	4.7	-4.6
1988	80.0	28.2	4.4	5.85	10877.8	7614.2	4.6	-3.9
1989	135.6	61.3	6.4	6.70	11151.6	7956.7	4.7	-0.8
1990	334.5	339.6	15.6	9.50	11842.0	8389.2	4.3	1.5
1991	411.1	446.7	29.1	9.55	12608.4	8656.3	4.3	2.9
1992	450.0	209.7	36.7	8.30	13100.5	8154.4	4.9	-1.1
1993	656.0	396.5	50.7	10.10	15003.3	8366.3	4.2	-2.6
1994	835.7	467.1	62.2	10.85	18205.0	8471.0	3.8	5.0
1995	1315.8	1014.9	87.1	14.50	20053.6	9127.0	3.6	3.2
1996	1352.2	683.6	92.4	15.95	22959.9	8921.7	3.3	2.9
1997	2209.3	1495.7	121.6	11.20	27194.0	10180.0	3.8	2.9
1998	2825.9	1807.2	175.2	12.30	26473.5	12101.9	4.2	4.0
1999	3173.0	2183.0	218.9	11.90	28929.7	11980.0	4.5	5.1
2000	4420.0	3030.0	295.0	-	32933.1	12435.7	-	4.0

Sources: The Central Bank of Trinidad and Tobago; The Unit Trust Corporation Annual Report, various issues.

In 1989, the Unit Trust also launched its Second Unit Scheme and saw remarkable growth on its introduction as the economy and the capital markets had begun to show signs of improvement.[2] In 1994, the dividend income allowance was reduced from 85% to 45%, which reduced the amount of income available for distribution. This affected the First Unit Scheme more than the Second Unit Scheme as the former was more heavily invested in equity. In 1994, therefore, total distributions from this scheme fell from $14.7 million to $13.1 million, mirroring the decline in the dividend income allowance to this scheme from $4.9 million in 1993 to $2.7 million in 1994.

Sales increased strongly from the Second Unit Scheme's inception to reach $811.2 million in 1995 but declined to $537.6 million in the following year. This was largely due to a change in tax policy as the authorities began dismantling tax incentives in the financial sector. In 1994, tax credits were removed from unit holders in the Second Unit Scheme. By 1996, the tax credit scheme was discontinued altogether and the dividend income allowance that investors in the First Unit Scheme had benefited from since 1984 was eliminated. Furthermore, in an effort to encourage competitive neutrality, the authorities imposed a broad-based 15% tax on interest income earned in the First and Second Unit Schemes.

At the same time a 15% tax was also imposed on interest income from bank deposits and a 15% transaction tax was imposed on financial transactions, excluding loans and deposits.

This trend of eliminating deductions and exemptions was also manifested in the reduction of the limit on tax-deductible mortgage interest payments per annum from $48,000 in 1986 to $18, 000 by 2001.

Even the contributions to approved pension plans and annuities were affected. The contributions to these plans are deductible against personal income tax up to a limit of 1/6 of chargeable income but subject to a maximum deduction per annum which has declined from $18, 000 to $12, 000 per annum.

The tax on interest income on deposits was eventually cut from 15% to 10%. This was driven by the fact that interest income from US dollar deposits of residents attracted a 10% tax, which created incentives for residents to substitute US dollar deposits for TT dollar deposits. This had implications for the demand for US dollars and led to some level of currency substitution (dollarisation). More importantly though, was the possibility that this could put pressure on the exchange rate given the relative demand for US and TT dollars. These concerns led the authorities to equalise the tax rate across deposits to remove a possible source of distortions.

These policy changes were part of a larger tax reform programme which sought to simplify, rationalise and generally make tax administration more effective. The main objectives of this programme were:

1. to broaden the tax base through the adoption of a broad-based sales tax, while at the same time lowering the tax rate on corporate and personal incomes;

---

2 For example in 1990 the economy recorded a real growth rate of 1.5%, the first positive growth rate after 7 consecutive years of negative growth.

2. to eliminate as many as possible of the exemptions and deductions which com-plicated tax administration and created many opportunities for tax evasion, and;

3. to encourage competitive neutrality as far as possible by applying broadly similar tax rates on commodities and products which were close substitutes.

The implementation of this programme led to the introduction of the Value Added Tax (VAT) system in 1990 at a rate of 15%. At the same time, the corporation tax moved from 40% in the 1988-94 period to 35% by 2001. The top marginal rate of personal income tax was also reduced to 35% in 2000 from 45% in 1989.

The objective of competitive neutrality in particular was supported by commercial banks, which argued that the tax system had given certain institutions an unfair advantage in markets where the banks competed. They further argued that this tax structure accentuated an already unfair situation where banks faced relatively higher reserve requirements and tighter regulations compared to other institutions. Irrespective of these arguments, however, it seems that the tax incentive regime did help to boost the fortunes of non-bank financial institutions, which helped to broaden and deepen the financial system. This impacted on the level of competitiveness as commercial banks had to respond to the challenges presented by these institutions. We now turn to the issue of the effectiveness of tax reform and its impact on the development of the financial sector.

4. The Impact and Effectiveness of Tax Reforms in the Financial Sector

These tax-induced changes in the financial sector seem to have contributed to the development of the financial sector in Trinidad and Tobago. Tax policy in the financial sector appeared to have been used successfully to encourage savings through new instruments and institutions. In this section, we attempt to determine whether tax policy (particularly tax incentives) was effective, that is, if at a minimum they helped to increase the growth of the tax-favoured institutional class. It should be noted that it is much more difficult to ascertain whether tax policy also helped to increase the growth of the entire financial sector. This issue is especially difficult since it is virtually impossible to evaluate the full range of substitution effects, given the deficiency of information on the range of substitutes for tax-favoured institutions and assets.

The development of the financial sector manifests itself in many ways. As mentioned above, one measure is an increase in the number and range of financial institutions and instruments, as well as the share of non-traditional institutions' assets in the total assets of all financial institutions. The new institutions such as the Unit Trust and the Home Mortgage Bank owe much of their growth and development to favourable tax treatment. The growth of credit unions was also influenced by their tax-favoured status.

The emergence and growth of instruments such as retirement savings accounts and annuities filled a gap in the market for individual retirement

accounts; however, they were also driven by a tax policy that increased their after-tax rate of return and/or reduced the overall tax burden of their holders. The emergence of private mutual funds was also driven by the competitive dialectic which was enhanced to a large extent by the granting of tax-favoured status to institutional alternatives to the dominant commercial banks.

The main developmental impact of these taxes seemed to hinge on the dynamic competitive game that it generated between the commercial banks and these institutions. The development of the Unit Trust, in particular, had important competitive implications for the commercial banks since units were close substitutes for bank deposits. Between 1989 and 1995, commercial banks' gross loans and deposits grew by 1% and 3.5% respectively, while the net interest margin moved from 4.7% in 1989 to 3.5% in 1995. In the same period, sales of units increased from $61.3 million to $974 million, while the offer price for units from the first unit scheme moved from $6.70 to $14.50.

The commercial banks had to respond to maintain market share. They responded by introducing mutual funds of their own, managed through their trust company subsidiaries. The competition continued in terms of foreign currency denominated mutual funds. Tax policy therefore not only served as a catalyst to widen and deepen the financial sector but to increase the level of competitiveness in the sector.[3] The creation of new products to meet this threat, in particular, served to widen the menu of financial assets available to consumers. The competitive response of the banks appears to have dampened (eventually) the positive impact of the tax incentives for these non-bank financial institutions, as the fading (though still strong) asset growth seems to attest to (see Table 3). An important issue, therefore, is the timing of the introduction and removal of tax incentives.

For a proper evaluation of these issues one needs information on portfolio composition and real after-tax rates of return at an individual level. Unfortunately, this information is not available and we are left with trying to delineate the impact of tax reforms from aggregate data on the relative growth rates and resource mobilisation efforts of tax-favoured and taxed institutions.

It is obvious from Table 2 that commercial banks still maintain a dominant position. Non-banks in general, but credit unions, the Unit Trust and insurance companies in particular, have made significant gains. The period in which tax incentives were used intensively basically corresponds to the period 1982 to 1995, as the major tax incentive was introduced in 1982 and 1986 and discontinued in 1996.

The percentage share of total assets of the Unit Trust Corporation did increase when the incentives were introduced and continued to increase even after the

---

3 In this same vein, retirement savings plans (annuities) were first offered by insurance companies and exploited the clause in the income tax laws which allows 1/6 of assessable income to be tax-free if contributed to a retirement annuity. Moreover, since these products are classified as insurance products, they are not subject to the 15% withholding tax imposed on bank interest income. The popularity of these products led the commercial banks and the Unit Trust to offer similar products (Sergeant 1995).

Table 2
The Institutional Share of Assets in the Financial System (%)

Institution	1980	1985	1990	1995	1999
Central Bank	46.7	23.0	22.0	18.0	13.1
Commercial Banks	33.9	41.9	38.2	41.7	40.6
Finance Companies and Merchant Banks	3.2	5.1	3.7	4.9	6.2
Trust and Mortgage Finance Companies	4.3	7.7	5.7	8.8	7.5
Development Banks	1.9	4.0	3.4	2.4	1.6
Credit Unions	1.4	2.9	5.4	5.9	4.3
Insurance Companies	5.2	8.4	11.6	11.4	13.1
National Insurance Board	3.4	6.5	7.6	7.7	7.4
Unit Trust Corporation	Na	0.1	1.1	3.1	4.3
Home Mortgage Bank	Na	Na	0.9	1.5	1.2

Source: The Central Bank of Trinidad and Tobago.

removal of incentives. This suggests that the incentives did spur demand for UTC shares but other fundamental factors such as the attractive risk/return profile compared to alternatives continued to drive the demand for this instrument after the removal of tax incentives. The percentage share of credit unions has fallen somewhat, especially after 1990 when the authorities started to gradually remove the tax-favoured status of these institutions. The main reason for this seems to be low returns on shares, a lack of innovation in products and competition in the loan market from other institutions. The competitive position of these institutions without the tax incentives is weak and the impact of the loss of tax-favoured status may be more significant. The share of commercial banks' assets in total financial assets has remained relatively stable from 1985 onwards, after one adjusts for the fact that the huge foreign exchange reserves of the Central Bank had given it a large share of total financial assets. The relatively stable share of commercial banks' assets suggests that they might not have suffered much from the granting of tax-favoured status to their competitors.

Table 3
Average Growth Rate of Assets by Institution (%)

Institution	1980-1985	1985-1990	1990-1995	1995-1999
Commercial Banks	19.0	4.0	12.9	8.0
Credit Unions	46.2	29.6	9.0	3.0
Unit Trust[1]	-19.5	294.6	58.6	28.7
Insurance Companies	30.4	16.3	9.6	13.9

Note: The average growth rate for the period 1980 to 1985 average is really 1982 to 1985 since the Unit Trust commenced operations in 1982.

Source: Central Bank of Trinidad and Tobago.

A study of the relative growth rate of the assets of these institutions in narrower periods could be more instructive. In particular, one could look at the growth rate for the periods 1980 to 1985, 1985 to 1990, 1990 to 1995 and 1995 to 1999. It appears from these comparisons that the highest growth rates for tax-favoured institutions occurred in periods when the tax measures were introduced and in place, with the lowest growth rates being generated in the period when tax incentives were removed. The data also suggest that the tax-favoured institutions were able to grow faster than their taxed counterparts during the period of the tax incentive regime (see Table 3).

In the case of the Unit Trust, the period 1982 to 1985 saw a diminution in the value of assets of the magnitude of 19.5%. Asset growth picked up dramatically (294.6%) in the period 1985 to 1990, after the introduction of the tax measures in 1986. Asset growth was 58.6% in the period 1990 to 1995 and 28.6% in the period 1995 to 1999. With respect to commercial banks, assets grew by 19% in the period 1980 to 1995, 4% in the period 1985 to 1990, 12.9% in the period 1990 to 1995 and 8% in the period 1995 to 1999. It is instructive to note that commercial banks faced essentially the same economic environment with the notable exception of the tax treatment, both at the corporate income level and at the level of their savings instruments. It seems, therefore, that the tax measures had a significant impact on the growth of the Unit Trust Corporation but not so much on the overall growth of the sector, given its small share of total financial assets.

Had the tax incentives been effective, the share of the tax-favoured institutional class would have increased relative to its taxed alternative during the period when tax incentives were in force. We also focus on the relative growth of the tax-favoured institutions' assets relative to its alternative. Again, if the tax incentives were effective, the growth rate of the tax-favoured assets would be higher than the alternative and the tax-favoured institution would grow faster in the tax incentive years compared to the period when the incentives were not available. We also formally test the validity of these propositions.

In this regard, we utilize the methodology outlined at the end of Section 2. To execute these tests, we utilize the analysis of variance (ANOVA) methodology. We test whether the average growth rate of tax favoured institutions was higher than that of their taxed counterparts (control group) in the tax incentive years. We also test whether the growth of the tax-favoured institutions was higher in the tax incentive years compared to the years when the tax incentives were not available. These tests are repeated using another indicator of institutional performance, the savings mobilisation performance of institutions, to ensure that the results are robust. These tests are executed using data for the period 1982 to 2000.

The assumption here is that both the banks and the Unit Trust compete in the same market and face the same environment with the exception of their tax

status.[4] Under these conditions growth during the periods of these two tax regimes should generate clear differences in performance.

Although tax reform would have impacted a range of institutions in the sector, we chose to illustrate our main contention by looking at one tax-favoured institution - the Unit Trust Corporation and one class of taxed institution - commercial banks, since information is readily available on these institutions.

The period for which the main tax incentives for the Unit Trust were available is the period 1986 to 1995. In 1996, all the tax incentives were removed with the exception of its tax-exempt status at the corporate level. The average growth rate for the assets of the Unit Trust in the period 1986 to 1995 was 54.67% compared to a growth rate of 7.2% for commercial banks in the same period. This suggests that the tax incentives had a significant part to play in the relative growth rates since the commercial banks faced the same environment, with the notable exception of the tax incentives.

The average growth rates for these institutions in the years 1982 to 1985 and 1996 to 2000, when the tax incentives were not in force, were 11.15% for the Unit Trust and 9.27 percent for commercial banks. This reinforces the view that tax incentives had a significant impact on the enhanced growth of the Unit Trust, given the convergence in growth rates when the incentives were not in force.

To test whether the differential performances across tax-favoured and taxed institutions were robust, we also looked at the savings mobilisation performances of these institutions. For this area of performance, we used the growth of bank deposits and the growth in the value of units outstanding as indicators of the savings mobilisation effort of these institutions. The average growth rate of units

Table 4
Institutional Indicators of Growth in the Tax Incentive Regime (1986-1995) and the Harmonised Regime Years (1982-1985 and 1996-2000)

Institutional Growth		Tax Incentive and Harmonised Tax Regime Years		
		1982-2000	1986-1995	1982-1985 and 1996-2000
Growth of Bank Assets	Mean	8.14	7.23	9.27
	S.D.	7.12	7.05	7.52
Growth of Bank Deposits	Mean	3.73	1.78	6.17
	S.D.	6.07	4.05	7.41
Growth of UTC Assets	Mean	35.33	54.67	11.15
	S.D.	41.05	37.94	32.23
Growth of UTC Units Outstanding	Mean	34.41	52.64	11.63
	S.D.	42.83	45.35	27.28

4 To the extent that there are other fundamental determinants of performance which impact in the tax incentive years differently from the years when tax incentives were not in force, then the above analysis would be less relevant. That is, this relates to the problem of the separating the impact of the tax incentives on performance from other determinants of performance.

outstanding for the period 1986 to 1995 was much higher (52.64%) when compared to the growth of bank deposits (1.78%) in the same period. There was some convergence in growth rates for the period when the incentives were not in force, as the growth rate for bank deposits in the 1982 to 1985 and 1996 to 2000 periods averaged 6.17% for bank deposits and 11.63% for the value of units outstanding (see Table 4).

To further evaluate whether these differential performances were robust, we utilised the analysis of variance methodology to test whether the observed differences in the average performance were statistically significant. The equality of means test[5] set in the analysis of variance framework was performed on the average performance of the institutions in the two areas for the period when tax incentives were used and in periods when they were not in force. The F-statistic was used to test the validity of these propositions. The results from these tests indicated that the average growth rates of the assets of commercial banks and the Unit Trust were significantly different at the 1% level when tax incentives were in force (see Table 5).

Moreover, the tests indicated that the average growth rates of these institutions were not significantly different (although the average growth rates were 11.15% and 9.27% for the Unit Trust and banks respectively) in the periods when the tax incentives were not in force.

---

5 This test is based on a single-factor, between-subjects, analysis of variance (ANOVA). The basic idea is that if the subgroups have the same mean, then the variability between the sample means (between groups) should be the same as the variability within any subgroup (within group).

Denote the *i-th* observation in group g as $x_{g,i}$, where $i=1, \ldots, n_g$ for groups g = 1,2, ...G. The between and within sums of squares are defined as

a) $$SS = \sum_{y=1}^{G} n_g (\bar{x}y - \bar{x}g)^2$$

b) $$SS_B = \sum_{y=1}^{G} \sum_{i=1}^{n_g} (x_{ig} - \bar{x}g)^2$$

where x_g is the sample mean within group g and $\bar{x}$ is the overall sample mean. The F-statistic for the equality of means is computed as

c) $$F = \frac{SS_B/(G-1)}{SS_W/(N-G)}$$

where N is the total number of observations. F-statistic has an F-distribution with G-1 numerator degrees of freedom and N-G denominator degrees of freedom under the null hypothesis of independent and identical normal distribution, with equal means and variances in each subgroup.

Table 5
Tests for Equality of Means

Average Growth Rate of Indicator	Df	F-Statistic	Pro-bability
GRBA82-00, GRUTA82-00	1, 34	7.66**	0.009
GRBA86-95, GRUTA86-95	1, 18	15.11**	0.001
GRBA82-85&96-00, GRUTA82-85&96-00	1, 14	0.03	0.875
GRUTA86-95, GRUTA82-85&96-00	1, 16	6.66*	0.020
GRBD82-00, GRUTUO82-00	1, 34	9.05**	0.005
GRBD86-95, GRUTUO86-95	1, 18	12.48**	0.002
GRBD82-85&96-00, GRUTUO82-85&96-00	1, 14	0.03	0.595
GRUTUO86-95, GRUTUO82-85&96-00	1, 16	5.04*	0.039

Notes 1. ** 1% level of significance
2. * 5% level of significance
3. GRBA=Growth rate of Bank Assets, GRUTA=Growth Rate of Unit Trust Assets,
GRBD=Growth Rate of Bank Deposits, and
GRUTUO=Growth Rate of Unit Trust Units Outstanding

These results suggest that the tax incentives were in fact a significant determinant of the differential performance since during the periods when they were in force the tax-preferred institutions grew significantly faster than the institutions (control group) which were not so preferred (see Table 5).

Another way of testing whether tax incentives were effective was to test whether the tax-preferred institution grew significantly faster in the years when tax incentives were in force compared to the years when they were not in force. The average growth rate of assets of the Unit Trust for the tax incentive years was 54.67% compared to a growth rate of 11.15% in the years when the incentives were not available. These averages were found to be significantly different at the 5% level of significance using the equality of means test (see Table 5).

Similar patterns emerge when the mobilisation of savings variable is utilised instead of asset growth. In fact, the Unit Trust experienced a faster average growth (52.64%) in its units outstanding, compared to the average growth (1.78%) of bank deposits in the period when tax incentives were in force. The average growth rates narrowed, however, in the periods when the tax incentives were not in force (11.63% and 6.17% growth rates for savings mobilisation for the Unit Trust and banks respectively). Moreover, the average growth rate for units

outstanding was 52.64% in the tax incentive years and 11.63% in the years when the tax incentives were not available. The equality of means test indicates that all averages were significantly different at the 5% level, except the average for the Unit Trust and banks in the period when tax incentives were not in force (see Table 5).

This is exactly the pattern for the test executed on the average growth rates of the assets of the Unit Trust and banks. These results suggest that the tax incentives drove the growth in tax-preferred institutions for the years in which they were in force. This situation arose largely because the average growth rate for the Unit Trust was significantly higher than that of banks in the tax incentive years and because there were no significant differences in the average growth between these institutions in the years when tax incentives were not in force. It would appear therefore that the provision of tax incentives was the factor that gave the Unit Trust its advantage over banks in the years when it grew faster than banks (see Table 5). The fact that the Unit Trust has improved its market share and enjoyed a level of growth equal to the commercial banks after the removal of tax incentives implies that this institution has gone past its dependence on tax incentives and can now compete on fundamental risk/return characteristics.

This review has concentrated mainly on the impact of taxation on the Unit Trust and commercial banks primarily because of data limitations and the fact that tax policy developments in these sub-sectors seemed to have had the most profound impact on the development of the financial sector.[6]

The results suggest that tax incentives for the Unit Trust did give that institution an edge over its competitors as evidenced by its faster growth during the period in which tax incentives were in place. Once the tax incentives were removed, however, its performance converged to the level of its competitors. Moreover, the impact of the tax incentives was more pronounced in the first four years but waned as the tax incentives were scaled back, and as banks developed new products to compete with the Unit Trust. This seems to indicate that tax incentives may only be useful in the short run but lose their effectiveness later on as products are developed across the market to take advantage of the market created by the tax incentives. In the long run, therefore, the maintenance of incentives would only result in reduced tax revenues for the fiscal authorities.

The insights which emerge from the utilization of tax policy to achieve financial development objectives and the theoretical review of the issues underpinning the taxation of the financial sector have many policy implications for tax policy in the financial sector in the Caribbean. We turn to this in the next section.

---

6 There are obvious tax-induced changes in the life insurance sector, primarily in terms of annuities and pension funds, which can have significant implications for the development of the financial sector but the absence of a good data set in this area frustrates this type of analysis.

5. Appropriate Approaches to Tax Policy for the Financial Sector

The insights which emerge from a review of the tax-induced changes in the financial sector and the theoretical issues related to taxation of the financial sector offer useful guidelines for tax policy in this area. In particular, a central issue is that taxes in the financial sector impose excess burdens and competitive distortions. Efforts to improve tax revenue yield must therefore always be careful to minimise these distortions for any given revenue yield. It also appears that excess burden varies inversely with the interest elasticity of demand therefore financial products which have many close substitutes and are therefore highly price elastic should be taxed at the lowest rates possible and/or taxed equally to minimise excess burden.

This is the competitive neutrality position which can help to minimise distortions for a given revenue yield. This is essentially the position which was adopted by the fiscal authorities in Trinidad and Tobago in 1996. This may, however, not be the best strategy to adopt in economies characterised by underdeveloped and by uncompetitive practices, as well as by missing markets. In such cases, tax policy could be a useful tool to encourage the introduction and development of new markets and institutions, which can enhance the competitiveness and efficiency of the financial sector.

Tax policy seems to have helped to achieve these goals in Trinidad and Tobago. What is also evident is that tax policy cannot be used indefinitely to provide an artificial fillip to particular assets and institutions because innovations emerge to ensure that all institutions benefit from the incentives. This only results in a reduction of tax revenues for the fiscal authorities. It is therefore practical to equalise the tax structure after some critical mass has been achieved. In other words, they should ideally be used as short-term measures. Once the institution being assisted has reached a critical mass, the tax regime should be equalised so that agents can compete on more fundamental risk/return parameters rather than on their tax status. In any event, if a tax preferred institution cannot compete on the basis of other factors such as risk/return dynamics, it would eventually lose market share as competitors develop tax-preferred assets to compete on tax status as well as their risk/return characteristics.

This is particularly easy to do in the financial sector, where the fungibility of finance means that institutions can easily repackage products to provide close substitutes for the tax-favoured instrument. This implies that this strategy can only work for a limited time; to do otherwise would only lead to a diminution in the tax revenue yield as more institutions and products qualify for the tax incentives in the form of exemptions and lower marginal tax rates. It could also create an environment where institutions create products based only on their tax status and ignore the development of products that meet the diverse needs of their clients.

The appropriate tax regime for the financial sector, especially in developing countries, must pay attention to these issues to effectively facilitate the development of the financial sector. Obviously, there would need to be an emphasis on different issues at different points in time and at different stages in the development of financial systems. Nevertheless, the key elements identified above

can help to structure an appropriate tax regime for the financial sector in small developing countries such as those in the Caribbean.

Selected References

Auerbach, A. and J. Slemrod. 1997. The Economic Effects of the Tax Reform Act of 1986. Journal of Economic Literature, Vol. 35, pp. 589-632.

Auerbach, A. 2001. "Taxation and Corporate Financial Policy." *NBER Working Paper,* No. 8203.

Auerbach, A. and J. Hines. 2001. "Taxation and Economic Efficiency." *NBER Working Paper,* No. 8181.

Auerbach, A. and M. King. 1983. "Taxation, Portfolio Choice and Debt-Equity Ratios: A General Equilibrium Model." *Quarterly Journal of Economics,* Vol. 98, pp. 587-609.

Auerbach, A. and L. Kotlikoff. 1981. "National Savings, Economic Welfare and the Structure of Taxation." *NBER Working Paper,* No. 729.

Basak, S. and M. Gallmeyer. 1998. Capital Market Equilibrium with Differential Taxation. Wharton School, University of Pennsylvania.

Baum, P. 1988. "Consumption, Wealth and the Rate of Interest: A Re-Examination." *Journal of Macro-economics,* Vol. 10.

Beach, C.M., R.W. Broadway and N. Bruce. 1988. Taxation and Savings in Canada. Economic Council of Canada.

Beck, T, R. Levine and N. Loayza. 2000. "Finance and The Sources of Growth." *Journal of Financial Economics* Vol. 58, Nos. 1 and 2, pp. 261-300.

Beck, T., A. Demirguc-Kunt, and R. Levine. 1999. "A New Database on Financial Development and Structure." *World Bank Policy Research Working Paper* No. 2146.

Bernheim, B.D. 1999. "Taxation and Savings." *NBER Working Paper* No, 7061.

Besley, T. and C. Meghir. 1998. "Tax Based Savings Incentives." *London School of Economic and Political Science Working Paper.*

Boskin, M. 1976. "Taxation, Savings and the Rate of Interest." *NBER Working Paper,* No 135.

Bourne, C. 1988. "Financial Deepening, Domestic Resource Mobilisation and Economic Growth: 1953-1982." In C. Bourne and R. Ramsaran eds. *Money and Finance in Trinidad and Tobago,* ISER, UWI, Kingston.

Craigwell, R. and L. Rock. 1990. "Dynamic Savings Behaviour in an Oil Dependent Economy: The Case of Trinidad and Tobago." *Central Bank of Barbados Working Papers.*

Ekanayake, E. 1991. A Study of the Quantum and Determinants of Savings in Post-War Trinidad and Tobago Economy, M.Sc. (Economics) Thesis, UWI, St. Augustine.

Elton, E. and M. Gruber. 1978. "Taxes and Portfolio Composition." *Journal of Financial Economics,* Vol. 6, pp. 399-410.

Engen, E., W. Gale and J. Scholz. 1996. "The Illusionary Effects of Saving Incentives on Savings." *Journal of Economic Perspectives,* Vol. 10, No. 4, pp. 113-138.

Friend, I. and J. Hasbrouck. 1983. "Savings and After-Tax Rates of Return." *Review of Economics and Statistics,* Vol. 65, 1983.

Fry, M. 1995. Money, Interest and Banking in Economic Development. The John Hopkins University Press, Baltimore.

Gertler, M. and R. Hubbard. 1993. "Corporate Financial Policy, Taxation and Macroeconomic Risk." *Rhand Journal of Economics,* Vol. 24, No. 2, pp. 286-303.

Haugen, R.A. and W. Serbert. 1986. "Corporate Finance and Taxes: A Review." *Financial Management,* Autumn, pp. 5-21.

Howrey, L. and S. Hymans. 1978. The Measurement and Determination of Loanable Funds Savings. Brookings Papers on Economic Activity, Part 2, pp. 655-685.

Hubbard, R. and J. Skinner. 1996. "Assessing the Effectiveness of Savings Incentives." *Journal of Economic Perspectives,* Vol. 10, No. 4, pp. 73-90.

King, R. and R. Levine. 1993. "Finance, Entrepreneurship and Growth: Theory and Evidence." *Journal of Monetary Economics.* Vol 32, pp. 513-542.

Levine, R. 1999. "Law, Finance and Economic Growth." *Journal of Financial Intermediation* Vol. 8.

Levine, R., N. Loayza and T. Beck. 2000. "Financial Intermediation and Growth: Causality and Causes." *Journal of Monetary Economics,* Vol. 46, No.1, pp. 31-77.

Long. J. 1977. "Efficient Portfolio Choice with Differential Taxation of Dividends and Capital Gains." *Journal of Financial Economics,* Vol. 6, pp. 25-53.

Makin, J. 1987. Savings, Pension Contributions and the Real Interest Rate. America Enterprise Institute Working Paper, No. 11.

Modeste, N. 1996. Financial Development and Economic Growth in Selected Caribbean Countries. Presented at the 28th Annual Monetary Studies Conference in Trinidad and Tobago, over the period October 28 to November 1996.

Montgomery, E. 1986. Where Did all the Savings Go? Economic Inquiry, Vol. 24.

Pagano, M. 1993. "Financial Markets and Growth: An Overview." *European Economic Review.* Volume 37, 1993, pp. 613-622.

Poterba, J., S. Venti and D. Wise. 1996. "How Retirement Savings Programmes Increase Saving." *Journal of Economic Perspectives,* Vol. 10 No. 4 , pp. 91-112.

Poterba, J. 2001. "Taxation Risk-Taking and Household Portfolio Behaviour." *NBER Working Paper,* No. 8340.

Ramsaran, R. 1988. "Determinants of Aggregate Savings in Post-War Trinidad and Tobago: An Explanatory Study." In C. Bourne and R. Ramsaran eds., *Money and Finance in Trinidad and Tobago,* ISER, UWI, Kingston.

Samwick, A. 2000. "Portfolio Responses to Taxation: Evidence from the End of the Rainbow." In J. Slemrod, ed., *Does Atlas Study? Russell Sage Foundation,* New York.

Sandmo, A. 1985. "The Effects of Taxation on Savings and Risk-Taking." In A. Auerbach and M. Feldstein, eds., *Handbook of Public Economics,* Volume 1, North Holland Amsterdam.

Sargeant, K. 1997. New Instruments in the Financial Sector of Trinidad and Tobago. Presented at the 27th Annual Monetary Studies Conference, St. Kitts.

Smith, R. 1990. "Factors Affecting Savings, Policy Tools and Tax Reform: A Review." *IMF Staff Papers* Vol. 37, No. 1, pp. 1-70.

Stiglitz, J. 1991. "Government, Financial Markets and Economic Development." *NBER Working Paper* 3661.

Summers, L. 1981. "Taxation and Capital Accumulation in a Life Cycle Growth Model." *American Economic Review,* Vol. 71, pp. 533-534.

Talmor, E. 1985. "Personal Tax Considerations in Portfolio Construction: Tilting the Optimal Portfolio Selection." *Quarterly Review of Economics,* Vol. 83, pp. 55-71.

Tanzi, V. and J. King. 1995. "The Taxation of Financial Assets: A Survey of Issues and Country Experiences." *IMF Working Paper.* No. 46.

Venti, S. and D. Wise. 1990. "Have IRAs Increased US Savings?: Evidence from Consumer Expenditure Savings." *The Quarterly Journal of Economics,* Vol. 105, No. 3, pp. 661-698.

Watson, P. and C. Ramlogan. 1991. Savings and the Rate of Interest in Trinidad and Tobago: An Empirical Analysis. Surveys and Development, Vol. 15, pp. 349-360.

Zephirin, M. and D. Seerattan. 1997. *Financial Innovations in the Caribbean, Caribbean Centre for Monetary Studies,* UWI, St. Augustine.

Section C:
An Examination of Special Sectors in the Caribbean

10

Commercial Banks and Credit Unions in Barbados: An Empirical Investigation

Anton Belgrave,
*Roland Craigwell & Winston Moore**

Abstract

This study empirically examines the relationship between commercial banks and credit unions using panel data in a small open economy. Unlike previous studies, which were largely static in nature, the paper accounts for the dynamic interaction between commercial banks and credit unions using an autoregressive distributed lag framework. Two hypotheses are examined: first, whether commercial bank competition influences credit union activity and second, whether credit union competition impacts on commercial banks' decision making processes. The study found that credit unions and banks are not directly competitive, in the sense that the actions of credit unions do not influence commercial banks' reactions and vice versa.

1.0 Introduction

This paper presents an empirical analysis of the relationship between commercial banks and credit unions in a small, open, developing economy. A credit union is a financial co-operative that is owned and controlled by its members. Therefore, its primary objective is to serve its members. Members are encouraged to save principally through the purchase of shares in the union, thus contributing to a pool of funds from which low-cost loans can be

* Belgrave and Moore are Senior Economists, while Craigwell is the Deputy Director of Economic Modelling in the Research Department of the Central Bank of Barbados.

Corresponding Author: Winston Moore, Research Department, Central Bank of Barbados, Tom Adams Financial Centre, Bridgetown, Barbados. Tel.:(246)436-6870, Fax:(246)427-1431. E-mail: wrmoore@centralbank.org.bb.

made available to all members. On the other hand, commercial banks are profit maximisers, with the difference between the interest received on loans and paid on deposits providing the main source of income. Given their structure, credit unions do not have such an objective function, as they are unlikely to simultaneously maximise the dividend paid to members, while concurrently minimising the rate on loans.

Despite these differences, commercial banks and credit unions compete for the same pool of depositors and prospective borrowers. Testimony to this is given by the constant complaints of bankers regarding the growth of credit unions (see Section 1 below). Yet, there is surprisingly little evidence of competitive tension between credit unions and the banking sector. In fact, most of the research of the interaction between credit unions and commercial banks has been undertaken using data from the United States (US). Emmons and Schmid (2000) who estimated a dynamic theoretical model of competition between banks and credit unions, made two intriguing predictions: some households respond to increased concentration among local banks in the current period by transferring accounts to credit unions in the next period, ceteris paribus, and that the higher the participation rate at credit unions in a given year, the larger the concentration in the commercial banking market in the following year, all else held constant. In short, credit unions and banks in the US are direct competitors in the local household deposit market. Feinberg (2001), utilising a modified version of the dominant firm-price leadership model, concentrates on the impact that credit unions have on the market power of commercial banks. Using a similar panel data methodology as Emmons and Schmid, his results revealed that the unsecured rates of banks are negatively influenced by the share of market deposits held by credit unions in the US. Similarly, Tokle and Tokle (2000) show that as credit unions' market share of local bank deposits rise in Idaho and Montana, interest rates on short-term deposits offered by banks also increase.

In an earlier US study, Rhoades (1987), though not dealing strictly with bank credit-union interaction, but rather with bank non-bank tension, found that when he regressed bank profitability on three Hirshman-Herfindahl indices of concentration, *inter alia*, a weak relationship existed between commercial banks' profit performance and the various indices of concentration, which attempted to measure the presence and importance of non-bank depository institutions. Similar results were found by Rhoades and Heggestand (1985) and Hannan (1984). Mushinski (1999) the only available study on a developing country (Guatemala), argues that banks and credit unions serve distinct markets and the markets catered for by credit union, would not be served in their absence. He found that credit unions appear to lend more to households with less desirable forms of credit and therefore are not direct competitors with commercial banks.

This paper adds to this sparse empirical literature by examining the relationship between commercial banks and credit unions in the Caribbean island of Barbados. The major contributions of the study are that it undertakes the analysis using data from a typical small open economy and accounts for the dynamic interaction between commercial banks and credit unions using an autoregressive distributed lag framework. Nearly all the previous work was based on data from the US and they were essentially static models.

The structure of the paper is as follows. Section 1 provides some background analysis of the development of credit unions and banks in Barbados. Section 2 outlines the conceptual framework utilised in the study, while Section 3 describes and analyses the data. Section 4 discusses the empirical results and Section 5 summarises the main findings.

2.0 Background

Commercial banks are the most important lenders in the Barbadian financial system, followed by mortgage lenders and finally credit unions (see Table 1). However, in examining the loan shares over time, it is clear that the growth of credit unions' has exceeded that of both banks and mortgage institutions, especially during the 1980s when a combination of Central Bank restrictions on the commercial banking sector and tax incentives for credit unions led to credit unions' loans, as a percentage of commercial banks' loans, expanding from 0.8% in 1980 to just under 10% in 1990. This rise in credit unions' share of the lending market continued into the 1990s – albeit at a significantly reduced rate – with total credit unions' loans reaching 11.2% of total commercial banks' loans by the end of 2000. However, the 1990-92 recession led to a sharp decline in the credit unions' rate of expansion, as a combination of high unemployment, salary cuts, and the introduction of new products by the commercial banks resulted in a moderation of asset growth.

A similar pattern is revealed in examining the deposits data with credit unions' share of total deposits rising from a negligible 0.2% in 1980 to 2.5% by 2000. Credit union membership growth rates are even more dramatic, increasing from under 7% of the total labour force in 1980 to 68% at the end of 2000. Indeed, Williams (1996, p.11) has argued that "one of the major outcomes of the performance of commercial banks in the Caribbean has been the loss of market share to non-banks." The growth of the credit union movement has attracted the regulatory attention of the Central Bank of Barbados, with some officials arguing for enhanced regulation of the credit union sector (Hinds and Chase, 1997). Hinds and Chase assert that while still endeavouring to meet the needs of the poor, the movement has become very sophisticated, offering a range of credit services and "competing directly with the established banking sector". They note that credit unions now offer automatic teller machine facilities, credit cards, mortgage loans, small business loans, chequing facilities, and bill paying services.

There have been a few studies examining the efficiency of the Barbadian financial system: Coppin, Craigwell and Moore (2003) using Data Envelopment Analysis and Stochastic Frontier techniques report that commercial banks are quite efficient at converting their inputs into outputs, while the results by Moore (2003) suggest that credit unions are relatively inefficient. However, credit union efficiency has been rising over time, especially in the 1990s.

3.0 Conceptual Framework

The predominant empirical and regulatory approach to banking competition has been the Structure-Conduct-Performance (SCP) paradigm. This procedure

Table 1
Summary of Credit Unions and Commercial Banks Loan and Deposit Data

Year	Total Loans	Com-mercial Bank Loans	Mortgage Finance Loans	Credit Unions' Loans	Unions Loans/ Banks Loans	Unions Deposits	Total Deposits	Unions Deposits/ Total Deposits
1980	800.7	546.6	70.6	4.2	0.8	1.2	738.1	0.2
1985	1383.8	849.0	117.8	22.9	2.7	4.8	1090.1	0.4
1990	2281.9	1235.6	306.1	109.2	8.7	17.2	1670.3	1.0
1995	2433.9	1522.5	379.5	165.6	10.8	29.5	2121.4	1.3
2000	3491.3	2712.6	359.6	302.8	11.2	87.1	3446.5	2.5

Source: Central Bank of Barbados.

presumes that measures of bank market structure, including those relating to market concentration, are good indicators of the intensity of competition (Scherer and Ross 1990, pp. 4-7). In essence, a higher market con-centration means larger prices for financial services and, consequently, bigger bank profits. The theoretical models specified in the study follow Rhoades (1987), who includes a Herfindahl-Hirshman index of market concentration, consisting of commercial banks and credit unions' share of total market deposits *(MP_{bu})*, commercial banks' share of total commercial bank and credit union deposits *(MP_b)* and credit unions' share of commercial bank and credit union deposits *(MP_u)*.

If credit unions are important competitors for commercial banks' business, then MP_{bu} should be an influential determinant of commercial banks' profit performance, and be negatively related to commercial banks' profitability, since its inclusion in the profit function is likely to erode the ability of banks to earn monopoly profits. However, MP_b should be positively associated with commercial banks' profitability because as concentration within the banking sector rises, the ability of banks to reap monopoly profits expands. Similarly, if commercial banks significantly affect credit unions' activity then MP_{bu} is likely to be an important determinant of credit unions' performance (profitability, efficiency and interest rate spread). It is expected that MP_{bu} should be negatively correlated with credit unions' profitability, since as credit unions gain market share their profitability should increase. On the other hand, MP_{bu} is likely to cause inefficiency and interest rate spreads to contract. MP_u is expected to be positively associated with credit union profitability, and negatively correlated with inefficiency and interest rate spreads. Ideally, different measures of market concentration should not lead to dissimilar findings, or the robustness of the results would have to be called into question. Thus, using loans rather than deposits as the unit of measure of market concentration in constructing MP_{bu}, MP_b and MP_u, should yield similar conclusions.

To look formally at the interaction between com-mercial banks and credit unions their objective functions must be defined. For commercial banks, it is customary to assume that banks are profit maximisers and incorporate such variables as inefficiency *(Ine),* market power *(MP_b)* and the amount of loans *(L)* into the profit function specification (see Moore and Craigwell, 2000). This standard specification is adopted, but extended to include a variable that represents credit union competition *(MP_{bu})* to determine whether commercial banks' profit performance is better explained by measures of market structure that take into account the presence of credit unions. Mathematically, the model is as follows:

$$\pi_b = f(\underset{-}{Ine_b}, \underset{+}{L_b}, \underset{+}{MP_b}, \underset{-}{MP_{bu}}) \qquad (1)$$

where π_b represents commercial banks profitability, and the subscripts b and u represent banks and credit unions, respectively. A priori, an expansion in the market power and loan portfolio of banks is expected to positively influence commercial banks' profitability, while increased inefficiency and total market concentration should reduce the rate of return obtained by commercial banks.

Defining the objective function of a credit union is, however, theoretically and empirically, more pro-blematic. As noted by many authors (for example, Smith, Cargill and Mayer, 1981; Smith, 1984), the standard theoretical treatment of financial intermediaries as profit maximisers cannot be applied directly to credit unions since the members of a credit union provide both the demand for and the supply of loanable funds, that is, a credit union intermediates between its member-savers and its member-borrowers. In this situation, it is not likely that a credit union can maximise its dividend rate for savers and minimise its loan rate for borrowers at the same time.

Because there is no generally accepted theory of credit union behaviour, three objective functions – profit maximisation, cost minimisation and spread mini-misation – were tested with a variable capturing bank competition included in each specification. As a result, the function for a profit maximising credit union (Hempel and Yawitz, 1977) can be formally written as follows:

$$\pi_u = f(\underset{-}{Ine_u}, \underset{+}{L_u}, \underset{+}{MP_u}, \underset{-}{MP_{bu}}) \qquad (2)$$

In this model, the union market power (MP_u) and loans (L_u) are expected to positively affect credit union profitability, while an increase in total market concentration and inefficiency are likely to decrease union profits.

Postulating cost minimisation, the union's objective function can be expressed in the following way:

$$C_u = f(\underset{+}{L_u}, \underset{-}{MP_u}, \underset{+}{MP_{bu}}) \qquad (3)$$

An expansion in the market power of credit unions is expected to lower the costs of credit unions (C_u) due to benefits from returns to scale. In contrast, as

the loan portfolio of the credit union expands, its costs should rise as well, because more resources have to be used to service the now larger loan portfolio. The effect of increasing total market concentration on the credit union's costs is expected to be positive, since this forces the credit union to incur higher expenditure as it attempts to augment the services offered to maintain its share of the deposit (loan) market.

An interest rate spread model, which posits that credit unions try to minimise the difference between interest received and interest paid, is also analysed, and is shown below:

$$Spread_u = f(\underset{+}{Ine}, \underset{+}{L_u}, \underset{-}{MP_u}, \underset{+}{MP_{bu}}) \qquad (4)$$

A priori, an expansion in the union's market power is expected to reduce interest rate spreads ($Spread_u$) while credit union inefficiency, loan portfolio and the total market concentration all should raise interest rate spreads.

4.0 Data Description

The main sources of the data used in this study are the Co-operatives Department of Barbados, which compiles quarterly balance sheet and income and expenditure statement information for all 42 credit unions, and the Central Bank of Barbados which collects similar data for all 7 commercial banks. The paper uses complete quarterly information on the credit unions and commercial banks operating in Barbados for the period 1994 to 2000. Summary statistics of this data are given in Tables 2 and 3.

Profitability in both financial institutions is measured by net income after taxes, expressed as a percentage of total assets. Inefficiency is total expenditure as a percentage of total assets, loans were also calculated as a percentage of total assets, and the interest rate spread is the difference between interest income and interest expenditure as a percentage of total assets. The competition variables are measured as described above in Section 2.

5.0 Econometric Results

Generally one would expect that the relationship between commercial banks and credit unions is dynamic, that is, current levels of credit union competition, for example, are likely to impact on commercial bank profitability in the future. Hence a dynamic approach to econometric modelling is employed, using the Hendry General-to-Specific methodology. This process requires an over-specified model (of lag order four, due to the frequency and span of the data), which is then reduced to a more parsimonious version by removing variables that do not significantly contribute to the explanation of the dependent variable. However, before this was undertaken, the data were tested for poolability using a Chow test (see Baltagi, 1995). The results indicate that the calculated F-statistic is greater than the critical F-value for all the models. Thus, the null hypothesis that the parameters are equal could not be rejected, leading to the conclusion

Table 2
Summary Statistics on Credit Union Activity in Barbados

	Average for all Credit Unions		
	Entire Sample	1994	2000
Profitability Indicators			
Return on Assets (%)	2.6	4.1	3.1
Interest Spread (%)	3.6	5.4	4.9
Efficiency Indicator			
Total Expenditure as a Percent of Total Assets (%)	3.1	3.9	3.3
Loans as a Percent of Total Assets	78.5	71.1	73.2
Market Structure Indicators			
Average Market Share - Deposits (%)	6.5	10.0	5.7
Herfindahl-Hirshman Index of Market Concentration	24.1	24.9	24.2
Average Market Share-Loans (%)	24.2	28.6	19.7
Herfindahl-Hirshman Index of Market Concentration	25.5	24.9	27.2

Source: Supervisor of Credit Unions.
Notes: Herfindahl-Hirshman Index is calculated using total deposits/loans and is defined as follows:

$100 * \sum_{i=1}^{n} a_i^2$ where a_i is the market share of a given credit union.

Table 3
Summary Statistics on Commercial Bank Activity in Barbados

	Average for all Banks		
	Entire Sample	1994	2000
Profitability Indicators			
Return on Assets (%)	0.3	0.3	0.4
I nterest Spread (%)	0.6	0.7	0.8
Efficiency Indicators			
Total Expenditure as a Percent of Total Assets (%)	1.9	1.9	2.2
Loans as a Percent of Total Assets	55.0	55.2	51.9
Market Structure Indicators			
Average Market Share - Deposits (%)	14.3	14.3	14.3
Herfindahl-Hirshman Index of Market Concentration	17.7	17.7	17.6
Average Market Share - Loans (%)	75.8	71.3	80.2
Herfindahl-Hirshman Index of Market Concentration	16.5	18.0	16.1

Source: Central Bank of Barbados.
Notes: Herfindahl-Hirshman Index is calculated using total deposits/loans and is defined as follows:

$100 * \sum_{i=1}^{n} a_i^2$ where a_i is the market share of a given credit union.

that the data are poolable. All estimations used generalised least squares with cross section weights and were done in the software package EVIEWS 3.1.White's Heteroskedasticity-Consistent standard errors were reported and the residuals from all the models were not serially correlated. In addition, the profit and interest rate spread models explained a significant proportion of the variation in these variables, while the cost model had a much lower Adjusted R-squared, suggesting at first glance, that credit unions' objective function may be more related to profit maximisation or spread minimisation than cost minimisation.

Table 4 gives the results for the commercial bank's profit function where deposits is the concentration measure used. The non-market structure variables all have their *a priori* signs. The inefficiency variable was found to have a negative long-run impact on commercial bank profitability. Therefore, a reduction in commercial bank inefficiency should increase commercial banks' rates of return. The coefficient on the loans variable indicates that an expansion in a commercial bank's loan portfolio raises commercial bank profitability in the long run. The negative long-run effect of the MP_b variable is, on the other hand, counterintuitive, as it implies that commercial banks' profitability is significantly reduced by an expansion in the concentration of the banking sector. Similarly, MP_{bu} also has the wrong sign in that the regression suggests that the long-run impact of an increase in MP_{bu} on commercial bank profitability is positive (0.002). The Wald test for the joint significance of the coefficients of MP_{bu} does not reject the null hypothesis that the coefficients are all equal to zero, implying that the long run effect of MP_{bu} is statistically insignificant. These findings imply that the Barbadian banking sector does not compete directly with the credit union movement and hence credit unions do not constitute much of a foil to commercial banks' market power.

The results of the three credit union equations (with deposits as the concentration variable) are presented in Table 5. As expected, a rise in inefficiency reduced union profitability, but led to a widening of spreads, as credit unions were less able to minimise the cost of borrowing to their members. An increase in the amount of loans implied a long-run expansion in union profits, interest rate spreads and costs.

Examining the credit union profit function (Column 2), the long run coefficient of MP_u possesses the wrong sign, suggesting that, contrary to expectation, an increase in concentration among credit unions indicates a reduction in union profitability. A similar unexpected result was recorded for the long-run coefficient of MP_{bu}, which, while marginal (0.003), possesses a positive rather than a negative sign. A Wald test for the joint significance of the coefficients of the MP_{bu} variable implies a rejection of the hypothesis that the coefficients are jointly zero, suggesting that the long-run coefficient is indeed significant. This finding indicates that banks are not in fact, important competitors to credit unions.

Empirical estimates of credit unions as cost minimisers (Equation 3) are presented in column 3 of Table 5. For the control variable MP_u, the negative and significant (according to the Wald test of joint significance) long-run effect implies that larger credit unions tend to have higher expenditure to total asset ratios in accordance with a priori expectations. As anticipated, an increase in MP_{bu} also leads to a significant rise in credit union inefficiency in the long-run. While the signs of the coefficients are in accord with expectations, the ability of the equation

Table 4
The Impact of Credit Union Activity on Commercial Bank Profitability

	Dependent Variable
	π_b
Intercept	0.092
	(13.141)***
Ine	-0.387
	(-6.052)***
Ine_{-4}	-0.264
	(-4.696)***
L	-0.0020
	(-6.015)***
L_{-2}	0.004
	(10.352)***
L_{-4}	0.002
	(4.716)***
MP_b	-0.443
	(-9.554)***
MP_{bu-1}	-0.016
	(-9.594)***
MP_{bu-3}	0.042
	(14.179)***
MP_{bu-4}	-0.024
	(-9.533)***
Adjusted R-squared	0.876
Standard Error	0.003
Number of Observations	193

Note: Concentration variables are based on deposits.

to explain the variation in the data is quite low, as demonstrated by the low R^2 (0.024).

Column 4 of Table 5 gives the empirical estimates of Equation 4 – the credit union interest rate spread equation. In line with a priori expectations, the control variable MP_u is negative in the long run, suggesting that as credit unions concentration rises, this tends to lead to a reduction in interest rate spreads. This gives support to the hypothesis that larger credit unions are more efficient and are better able to lower the cost of borrowing to members. Again, the results for MP_{bu} are very similar to the preceding models: a small positive (and jointly significant) long-run effect (0.002). This could mean that a reduction in the relative market power of credit unions results in a small increase in credit unions' spreads. Of the three equations that attempt to explain credit union behaviour,

Table 5
The Impact of Commercial Banks on Credit Unions
(Entire Sample)

	Dependent Variable		
	π_u	C_u	Sprea
Intercept	0.019	0.002	-0.001
	(7.458)***	(1.058)	(-0.233)
Ine	-	-	0.709
			(15.578)***
Ine_{-1}	-0.212	-	-0.167
	(-13.611)***		(-4.576)***
Ine_{-2}	-0.182	-	-0.151
	(-11.369)***		(-4.530)***
Ine_{-3}	-0.224	-	-0.120
	(-12.113)***		(-2.948)***
Ine_{-4}	0.265	-	0.178
	(13.675)***		(5.525)***
L	0.004	0.005	
	(2.572)**	(1.872)*	-
L_{-1}	0.006	0.005	0.029
	(3.886)***	(2.222)**	(2.225)**
L_{-2}	-	-	-
L_{-3}	-	-	-
L_{-4}	0.003	0.003	-
	(3.160)***	(1.907)*	
MP_{bu}	0.023	-0.043	-
	(2.155)**	(-3.935)***	
MP_{bu-1}	0.027	0.092	0.033
	(2.384)**	(6.841)***	(3.372)***
MP_{bu-2}	-0.041	-	-0.026
	(-3.654)***	-	(-2.647)***
MP_{bu-3}	-0.025	-0.034	-0.022
	(-2.642)***	(-3.184)***	(-2.004)**
MP_{bu-4}	0.019	-	0.035
	(1.776)*	-	(3.696)***
MP_u	0.279	-0.633	-0.370
	(1.902)*	(-5.000)***	(-3.066)***
MP_{u-1}	-	-	0.277
			(2.088)**
MP_{u-2}	0.396	0.631	-
	(2.207)**	(4.395)***	
MP_{u-3}	0.411	0.971	-
	(1.853)*	(4.109)***	
MP_{u-4}	-1.216	-1.030	-
	(-6.197)***	(-4.729)***	
Adjusted R-squared	0.774	0.024	0.783
Standard Error	0.016	0.019	0.015
Number of Observations	683	871	703

Note: Concentration variables are based on deposits.

the interest rate spread equation performs best, in the sense that the R^2 is relatively high (0.78), while the signs are in accord with expectations.

The three credit union equations were also estimated using the data on only the 12 largest unions to assess whether the impact of commercial banks' competition on credit unions depended on the size of the union (see Table 6). The main difference observed was that only one of the MP_{bu} variables was significant in the credit union interest rate spread equation. These results could be interpreted to mean that the interest rate spreads of large credit unions tend not to be significantly influenced by the decisions of commercial banks. This finding is in accordance with the previous inferences that credit unions seem to serve a particular segment of the financial market not already served by commercial banks.

Equations 1, 2, 3 and 4 were re-estimated using the loans data to form Herfindahl-Hirshman indices of concentration. These results were largely identical to those reported for the deposits data and are not reported here, but are available from the authors.

Table 6
The Impact of Commercial Banks on Credit Unions
(12 Largest Unions)

	Dependent Variable		
	π_u	C_u	$Spread_u$
Intercept	0.021	0.030	0.027
	(4.376)***	(6.258)	(6.067)***
lne	-	-	0.737
			(10.564)***
lne_{-1}	-0.270		-0.333
	(-11.065)***	-	(-17.197)***
lne_{-2}	-0.254		-0.327
	(-8.785)***	-	(-15.267)***
lne_{-3}	-0.311		-0.275
	(-8.856)***	-	(-10.202)
lne_{-4}	0.304		0.114
	(8.852)***	-	(1.708)*
L	0.004	-0.002	-
	(2.241)**	(-7.073)***	
L_1	0.004	-0.002	0.007
	(5.047)***	(-5.577)***	(2.324)**
L_{-2}	-0.001	-0.002	
	(-3.004)***	(-6.609)***	-
L_{-3}	-	-0.002	
		(-5.669)***	-
L_{-4}	0.002	-0.003	0.004
	(3.375)***	(-7.401)***	(1.905)*
MP_{bu}	0.000	-	-
	(2.661)***	-	-
MP_{bu-1}	-	0.001	0.000
		(3.992)***	(3.507)***
MP_{bu-2}	-0.000	-0.000	
	(-1.859)	(-2.220)**	-
MP_{bu-3}	-	-0.001	
		(-2.769)***	-
MP_{bu-4}	0.000		
	(2.361)**	-	-
MP_u	0.607	-0.846	-0.456
	(2.926)***	(-2.746)***	(-3.864)***
MP_{u-1}	-	-	-
MP_{u-2}	-	1.498	
		(5.574)***	-
MP_{u-3}	-	2.006	
		(3.718)***	-
MP_{u-4}	-1.385	-2.714	
	(-4.266)***	(-5.360)***	-
Adjusted R-squared	0.676	0.371	0.885
Standard Error	0.010	0.016	0.014
Number of Observations	226	269	230

Note: Concentration variables based on deposits

6.0 Conclusions

The objective of this article is to empirically examine the relationship between commercial banks and credit unions. This is done using quarterly firm-level credit union and commercial bank data from the Caribbean island of Barbados over the period 1994-2000. The approach used examines how competition from credit unions affected commercial banks' objective functions and similarly how competition from commercial banks influenced credit unions' objective functions. As is normally assumed in the literature, commercial banks were modelled as profit-maximising entities. However, since previous theoretical studies on credit unions have used a variety of objective functions, this study examines three of these many specifications – profit maximisation, cost minimisation and spread minimisation.

The results of the study indicate that credit unions do not act as a significant foil to the market power of commercial banks. Examining the influence of commercial banks on the operations of credit unions, the study also finds that increased commercial bank competition does not influence credit unions' behaviour either. While tentative, these results would lead to the conclusion that over the 1994-2000 period of the study, the credit union and commercial banks effectively served non-overlapping and hence non-competing markets. In this regard, the findings are similar to Mushinski (1999), the only other study done in a developing country. However, one caveat which arises is that the study did not cover the 1980s period, when credit union growth was fastest, due to the unavailability of data. Thus, the findings should be considered a first step in examining the interaction between commercial banks and credit unions.

Selected References

Baltagi, B.H. 1995. *Econometric Analysis of Panel Data*, John Wiley and Sons Ltd., Baffin Lane, Chichester, England.

Coppin, K., Craigwell, R. and W. Moore. 2004. "Financial Innovation and Efficiency in the Barbadian Banking Industry", forthcoming in *Savings and Development.*

Emmons, W.R. and F. A. Schmid. 2000. "Bank Competition and Concentration: Do Credit Unions Matter?", *Federal Reserve Bank of St. Louis Review*, May/ June, pp. 29-43.

Feinberg, R.M. 2001. "The Competitive Role of Credit Unions in Small Local Financial Services Markets", *The Review of Economics and Statistics*, August, pp. 560-563.

Hannan, T.H. 1984. "Competition between Commercial Banks and Thrift Institutions: An Empirical Examination", *Journal of Bank Research*, Vol. 15, pp.8-14.

Hinds, D. and K. Chase. 1997. "Credit Unions in Barbados: A Case for Enhanced Regulation", Central Bank of Barbados Working Papers, Vol.1, pp. 115-134.

Hempel, G., and J. Yawitz. 1977. *Financial Management of Financial Institutions*, Prentice-Hall.

Mushinski, D. 1999. "An Analysis of Offer Functions of Banks and Credit Unions in Guatemala", *Journal of Development Studies*, Vol. 36, No. 2, December, pp. 88-112.

Moore, W. and R. Craigwell. 2000. "Market Power and Interest Rate Spreads in the Caribbean", *Inter-national Review of Applied Economics*, Vol. 16, No. 4, pp. 391-405.

Moore, W. 2003. "The Determinants of Credit Union Efficiency in Barbados", *Journal of Eastern Caribbean Studies*, Vol. 28, No. 3, pp. 40-55.

Rhoades, S.A. 1987. "The Effect of Non-Bank Thrift Institutions on Commercial Bank Profit Performance in Local Markets", *Quarterly Review of Economics and Business*, Spring, Vol. 27, pp. 16-28.

Rhoades, S.A. and A.A. Heggestad.1985. "Multimarket Interdependence and Performance in Banking: Two Tests", *The Antitrust Bulletin*, Vol. 30, pp. 975-996.

Smith, D. J., T. Cargill, and R. Mayer. 1981. "An Economic Theory of a Credit Union", *Journal of Finance*, Vol. 36, pp. 519-528.

Smith, D. 1984. "A Theoretic Framework for the Analysis of Credit Union Decision Making", *Journal of Finance*, Vol. 39, pp. 1155-1168.

Tokle, R.J. and J.G. Tokle. 2000. "The Influence of Credit Union and Savings and Loan Competition on Bank Deposit Rates in Idaho and Montana", *Review of Industrial Organisation*, Vol. 17., pp. 427-439.

Williams, M. 1996. *Liberalising a Regulated Banking System: The Caribbean Case*, Avebury, Ashgate Publishing Limited, Gower House, Aldershot, England.

11

An Analysis of the Manufacturing Export Sector in Jamaica in the Nineties

Karl M. Bennett

Abstract

It is demonstrated that initiatives in the areas of exchange rate management and monetary and fiscal policy did not help to stimulate the performance of the manufacturing export sector in Jamaica in the nineties. A series of indicators was used to assess the extent to which deficiencies in the quality of management might have made a major contribution to the poor performance of the sector. It is argued that these management deficiencies reflect broader institutional shortcomings in the society at large, which work to create an environment not conducive to innovative activity at the firm level.

Introduction

At the beginning of the decade of the nineties, the Jamaican authorities embarked on a programme of economic liberalization. The initiatives adopted, the most prominent of which was the liberalization of the exchange rate regime, appeared to address what might have been considered elements of an anti - export bias in the existing policy framework. The expectation was that the new policy environment would provide a basis for an expansion in exports of manufactured products. There was an initial sharp increase in exports of manufactured goods in the years immediately following the initiative. However, the post 1995 period has witnessed a major decline in exports of manufactured goods. The development in the latter period might, in part, be linked to the establishment of NAFTA. This changed the competitive environment for the country's exporters in their major export market, and it appears Jamaican exporters experienced difficulty in adjusting to the change.

In this paper there will be an analysis of some of the internal and external factors which might have contributed to the poor performance of the sector. In this regard, we will be concerned with an examination of what role might have been played by the exchange rate, as well as in monetary and fiscal polices. This will be followed by an assessment of the potential significance of management shortcomings in the performance of the sector.

In the first section of the paper there will be a brief review of the evolution of the export sector and the overall performance of the economy in the nineties. Included in this section will be an assessment of factors which might be indicative of trends in the international competitiveness of the manufacturing sector. In the subsequent section, we will turn to a consideration of policy initiatives by first examining the impact of fiscal and monetary policy initiatives on the evolution of the real effective exchange rate. This is being done to provide insights into what role the rate might have played in the performance of the sector. In the third section, attention is directed to the issue of the role of the quality of management in the overall performance of the manufacturing sector and in exports of manufactured products. In the final section, there will be a discussion as to the types of initiatives required if the country is to realize success in expanding and diversifying its exports of manufactured products.

The Jamaican Economy in the Nineties

The decade of the nineties might well go down as another lost decade for Jamaica. The overall average annual GDP growth rate, over the decade, was less than one percent. There was negative growth in each year from 1996 through 1999. The manufacturing sector performed even more poorly than the overall economy. Real output of the sector declined at an annual average rate of almost 2 percent. In fact, as shown in Table 1, the sector recorded positive growth in only four years. The sector's contribution to GDP declined from 21 percent in 1990, to 16 percent by 2000.

Table 1
Rate of Growth of Gross Domestic Product and Percentage Contribution of the Manufacturing Sector at Constant (1986) Prices

Year	Total GDP	Manufacturing Sector	Manufacturing % Share GDP
1990	5.6	3.9	21.1
1991	0.9	- 7.7	19.3
1992	1.6	1.6	19.3
1993	1.7	- 1.4	18.7
1994	1.1	0.3	18.6
1995	0.7	- 0.9	18.3
1996	- 1.3	- 3.1	18.0
1997	- 2.0	- 2.9	17.8
1998	- 0.5	- 4.7	17.0
1999	- 0.4	- 1 4	16.9
2000	0.8	0.7	15.9

Sources: Bank of Jamaica, *Statistical Digest.*
IMF *Jamaica Country Report, N0.01/84.*

Given the openness of the economy, the performance of the export sector mirrored that of the overall economy. The overall annual average rate of growth of exports was approximately one percent. There was a modest increase in export sales to the United States, the country's major trading partner. However, as the data in Table 2 reveal, export sales to all the other major trading partners declined over the course of the decade. The decline in sales occurred mainly in the post 1995 period. Exports of manufactured products, as shown in Table 3, tripled in value between 1990 and 1995. In that period, the share of manufactured products in total exports rose from 9 percent to 21 percent. However, there was a steady decline in the last half of the decade, which was reflected in the fact that the value of these exports in 2000 was approximately 50 percent of the 1995 value. The share of manufactured products in total exports at the end of the decade had fallen back to 12 percent. The pattern reflected developments in the exports of garments to the United States. There was a sharp decline in sales in the post 1995 period following the inception of NAFTA, with producers relocating to Mexico, a now more favourable location.

Table 2
Value of Exports to Principal Trading Partners: US$ Millions

Year	US	UK	Canada	EEC	CARICOM
1990	339.1	174.1	129.2	166.8	71.0
1991	342.0	186.1	119.3	173.4	63.1
1992	336.3	180.2	119.8	65.6	60.0
1993	419.0	147.9	107.4	126.0	59.9
1994	439.7	164.4	147.7	122.1	58.1
1995	520.8	189.7	167.3	219.9	60.4
1996	510.8	183.7	163.7	242.9	55.7
1997	462.9	186.5	195.3	215.7	47.7
1998	521.3	158.9	154.3	217.1	43.6
1999	441.0	161.0	130.0	196.0	42.2
2000	509.0	149.0	133.0	143.0	48.6

Sources: Bank of Jamaica, *Statistical Digest.*
IMF *Jamaica Country Report, N0.01/84.*

The overall contraction of the manufacturing sector and the post 1995 decline in exports from the sector have raised questions with respect to the overall level of international competitiveness of the sector. For example, a study conducted by Kurt Salmon Associates, cited in an IMF Staff Country Report (IMF, 2000), pointed out that for the textile industry Jamaica ranked close to the top, compared to other countries in terms of various components of cost of production. High labour costs and interest rates were singled out as the principal factors undermining the country's international competitiveness in this sector (IMF, p.27).

Table 3
Exports of Manufactured Products[1]

Year	Total US$ Million	Percent Total Exports
1990	99.3	8.5
1991	100.0	8.6
1992	165.8	15.7
1993	211.9	19.7
1994	264.9	21.7
1995	302.6	21.0
1996	265.1	19.1
1997	238.9	17.2
1998	212.9	16.1
1999	168.4	13.5
2000	156.2	12.1

Sources: Bank of Jamaica, *Statistical Digest.*
IMF *Jamaica Country Report, N0.01/84.*

[1] Miscellaneous manufactured products, S.I.T.C. Section 8.

We will now proceed to review a set of factors which will shed some light on what might have accounted for the weakening in the competitive position of the sector. In view of the fact that exchange rate misalignment is often seen as being a major factor in poor export performance, we will begin by conducting a review of the evolution of the exchange rate over the period. In the post Bretton Woods era, a measure of the degree of exchange rate overvaluation or misalignment is derived from observing trends in the real effective exchange rate. An appreciation in the real effective exchange rate is seen as being indicative of a departure from purchasing power parity, undermining the competitive position of exporters.

The real effective exchange rate, based on relative movements of the consumer price index of the country and that of its principal trading partners, appreciated steadily between 1992 and 1998. The bilateral real exchange rate with its principal trading partner, the United States, as shown in Table 4, also followed a similar pattern. The real effective exchange rate appreciated by 72 percent between 1992 and 1998 and the bilateral real exchange rate with the United States by 61 percent. However, both the real effective and bilateral real exchange rates depreciated in the 1999/ 2000 period.

There are a number of potential shortcomings in using departures from relative purchasing power parity as an indicator of exchange rate misalignment. Williamson (1985), in introducing the concept of the fundamental equilibrium

Table 4
Jamaica: Exchange Rates Indices[1]
Period Averages

Year	Real Effective Exchange Rate Index	Bilateral Real Exchange Rate Index
1990	100.0	100.0
1991	90.3	83.1
1992	78.1	79.0
1993	88.0	86.3
1994	86.0	85.7
1995	91.5	94.0
1996	108.9	109.3
1997	125.9	123.1
1998	134.2	127.2
1999	133.0	123.2
2000	130.6	117.2

Source: IMF, *Staff Country Report N0. 00/19.*

[1] Increase in the index represents an appreciation of the Jamaican dollar.

exchange rate, argued that the equilibrium exchange rate is driven by economic fundamentals and can therefore deviate substantially from the path of purchasing power parity. However, given the weak performance of the export sector in this period, the real appreciation of the exchange rate could hardly be considered an equilibrium phenomenon.

In a recent IMF Report (IMF, *Staff Country Report no. 00/19*), a series of competitiveness indicators was used to highlight the deterioration in the competitive position of the Jamaican economy. We will now proceed to outline the methodology used in the IMF study to establish a series of benchmarks for assessing the competitive position of the manufacturing sector, and report on the findings. Competitiveness was examined by investigating how profitability, in the sector evolved over time. In assessing profitability, developments in unit labour costs were compared with movements in the GDP deflator. The GDP deflator measures the cost of the two components, labour and capital, in producing value added. Consequently, if unit labour costs rose faster than the GDP deflator, then the return to capital, and hence profitability, must be declining. The findings from the study, which are reproduced in Table 5, reveal that from 1990 - 96, the annual percentage increase in unit labour costs exceeded that of the GDP deflator by a substantial margin in all but two years. In 1997 - 98, the change in the GDP deflator was marginally greater than that of unit labour costs.

Table 5
Manufacturing Sector: Indicators of Competitiveness
Percentage Change

Year	GDP Deflator	Unit Labour Cost	Output per Worker	Relative Price Manufacturing/Services[1]
1991	54.9	57.7	- 7.6	13.8
1992	63.9	70.7	35.8	0.9
1993	30.8	33.6	1.5	- 6.8
1994	34.8	17.6	- 2.7	9.6
1995	17.6	35.9	- 2.0	- 4.8
1996	20.9	20.7	- 0.4	- 2.4
1997	8.5	7.2	9.6	- 3.0
1998	4.0	3.1	0.7	- 3.7
1999	9.7	17.2[2]	5.0	3.6

Source: IMF *Staff Country Report No. 00/19,* February 2000 and author's estimates.

1 Services include electricity and water, construction and installation, distributive trade, transport, storage and communication, finance and insurance, real estate and business services, government services.

2 Percentage change in the real wage.

The evolution of unit labour costs was in large part a reflection of the trend in labour productivity. There was very little change in real output per worker after 1991. Real output per worker declined in each year from 1992 through 1996. Since 1996 there has been some positive growth in productivity, but these increases were more than offset by significant increases in real wages.

Another indicator employed was the trend in the relative price of manufacturing output. The relative price of manufacturing output relative to what may be deemed as production geared primarily to the home market, declined. These include sectors engaged in the provision of services, as well as construction and installation.

In summary, the various indicators all point to a weakening in the competitive position of the sector over the course of the decade. This underscores the evidence of a lack of dynamism in exports of manufactured goods.

Exchange Rate Management

The decision to abandon exchange controls and adopt a market-based exchange rate regime was, in part, based on the notion that this would work towards minimizing the trend towards exchange rate misalignment. At the same time, a move to a market based regime raises the issue as to how exchange rate volatility could be avoided , given the thinness of the foreign exchange market. A relative degree of stability could only be achieved by maintaining balance between aggregate demand and productive capacity. The initial approach adopted by the

Bank of Jamaica placed primary emphasis on the interest rate mechanism as the means of controlling aggregate demand. Throughout the decade the bank maintained interest rates at high levels in nominal and real terms. At the same time, less emphasis was placed on controlling the rate of growth of the money supply. The average annual percentage change in the money supply, i.e., money and quasi money, of 27 percent, as shown in Table 6, exceeded by a substantial margin the annual average rate of inflation. There was, also, significant annual increases in commercial bank credit to the private sector in the 1993 - 96 period. The high interest rates, by dampening aggregate demand, should have worked to stabilize the real exchange rate by reducing inflationary pressures. On the other hand, the increases in the money supply and credit to the private sector would have had the opposite effect. Apart from these monetary policy issues, there is the question as to what other internal and external developments might have had an impact on the evolution of the real effective exchange rate.

Table 6
Monetary Policy Indicators

Year	Interest[1] Rate	Real Interest[2] Rate	Inflation Rate	Percent Change in Private Sector Credit	Money[3] Supply
1990	30.8	9.2	19.8	17.7	15.8
1991	31.8	-6.7	41.3	25.2	36.4
1992	46.6	-6.7	57.2	26.2	67.8
1993	44.3	20.3	20.0	63.0	44.2
1994	48.7	14.4	30.0	43.0	38.1
1995	43.6	21.5	18.2	39.6	33.7
1996	38.9	12.6	23.4	31.9	19.3
1997	32.6	21.4	9.2	-3.5	18.9
1998	31.5	21.4	8.3	-19.9	8.5
1999	26.9	19.9	5.8	-21.0	14.5
2000	23.0	14.0	7.9	-3.8	13.4

1 Average of end of quarter weighted average lending rate of commercial banks.

2 (1 + i)/(1 + Inf) - 1.

3 Average end of quarter values of money and quasi money.

There have been several empirical investigations geared towards an identification of factors which are the underlying determinants of trends in the real effective exchange rate. Williamson (1983) introduced the concept of the fundamental equilibrium exchange rate. Edwards(1989) conducted a wide-ranging empirical investigation covering several developing countries, geared at estimating departures from equilibrium and the speed of adjustment to equilibrium. There

have been several other studies concerned with trying to estimate the degree of potential exchange rate overvaluation in developing countries. A comprehensive survey of these efforts, as well as some of the methodological and empirical difficulties encountered in conducting this work, can be found in Hinkle and Montiel (1999). These studies identified internal factors such as the share of government consumption and investment in GDP and productivity trends as being important contributors. In addition, external factors, such as direct investment flows, the terms of trade and the degree of economic openness, as measured by the trade share in GDP, were also identified as being of importance. Various estimates were made of the impact of some of these factors on the evolution of the Jamaican real effective exchange rate over the period 1984 to 2000. The best results were derived from the following specifications.

$$\begin{array}{lll} REER = 0.54\ Gcon & -0.33\ Irate + 0.08\ credit & (1) \\ \quad (3.64) & (-3.37) \quad (4.23) & \end{array}$$

$$R^2 = 0.94;\ R^2_{adj} = 0.93;\ DW = 2.12$$

$$\begin{array}{lll} REER = 0.59Gcon & -0.26Irate + 0.05\ Money & (2) \\ \quad (4.15) & (-2.96) \quad (4.06) & \end{array}$$

$$R^2 = 0.94;\ R^2_{adj}\ 0.93;\ DW = 1.90$$

[*t* values are in parentheses]

where Gcon represents government expenditure as a percentage of GDP; Irate, the weighted average lending rate of the commercial banks, credit, commercial bank credit to the private sector and money representing money and quasi money. The data are annual and all variables are expressed in natural logarithms. All the variables, as judged by the Augmented Dickey - Fuller test were non stationary in levels and stationary in first differences at the 5 percent critical value. The residuals of equations (1) and (2) were also stationary at the 5 percent critical value. The coefficients were highly significant and had the expected signs. An increase in government consumption expenditure would normally be expected to lead to an appreciation in the real exchange rate through an increase in the price of non-tradeables. An increase in credit to the private sector would have similar consequences. The constraint on spending arising from higher interest rates should lead to a real exchange rate depreciation.

There was a steady increase in government consumption expenditure in the post 1992 period. It would appear that the combined impact of the growth in government consumption expenditure, increases in the money supply and credit to the private sector worked to offset the impact of the high interest rates. The change in emphasis by the Bank of Jamaica, in the period after 1997, to place heavier reliance on restricting the availability of credit appeared to have worked towards reversing the trend towards appreciation in the real exchange rate.

The appreciation in the real effective exchange rate, other things being equal, would work to undermine the competitive position of exporters. At the same time, as was pointed out earlier, among other potentially significant factors were the very low rates of growth of labour productivity in the sector. An assessment of the combined effects of changes in the exchange rate and labour productivity on exporters of products from the sector yielded the following results.

$$MFGX = \underset{(1.90)}{1.50\ REER_t} \underset{(-3.28)}{- 2.24\ (REER)_{t-1}} + \underset{(3.72)}{1.70lprodm} \qquad (3)$$

$R^2 = 0.74$; R^2 adj. = 0.69; DW = 1.78

[*t* values are in parentheses]

where MFGX represents exports of manufactured products, SITC Section 8, REER represents the real effective exchange rate and Lprodm, real output per worker in the manufacturing sector. The data are annual, covering the period from 1984 to 2000 and all variables are in natural logarithms. A real appreciation of the exchange rate had a significant negative impact on exports of manufactured goods with a one period lag. Not surprisingly, increases in labour productivity had a positive impact on exports from the sector. However, given the small increases in productivity, it would have had a minimal impact on exports.

The Quality of Management

One would expect that the following factors would play a significant role in the overall performance of the sector. First would be the level of investment activity in the sector. In this context, the issues of particular concern, in addition to quantity, would be those pertaining to the quality of investment. For example, to what extent are firms in the sector investing in machinery and equipment embodying new technology appropriate to the local environment? What are the levels of expenditure on investments in upgrading the skills of the work force to facilitate the effective exploitation of this technology? Failure to take appropriate action to keep up with advances in technology and in upgrading the skills of the labour force could be seen as reflecting poorly on the quality of management. In Jamaica, if one were to use gross investment as a guide to the overall level of sectoral investment activity, investment levels were not low by international standards. Gross fixed capital formation as a percentage of GDP ranged between 26 and 34 percent from 1990 to 2000. The poor performance of the sector might be more a reflection of deficiencies in the quality of the investment expenditures than in the level of investment.

It will be argued here that a useful guide as to the extent to which producers were investing in new technology would be the level of expenditure on imported machinery and equipment. In the absence of direct evidence on expenditures on training it is assumed that the growth in labour productivity in the sector could be a useful indicator as to the level of expenditures in this area. Finally, one

would expect all forms of investment to be affected by the cost and availability of funds. This would, in turn, be determined by the monetary policy stance of the Central Bank.

In light of these considerations, an indirect approach was adopted in an effort to arrive at an estimate of the impact of the quantity and quality of investment activity on the performance of the sector. Expenditure on imported machinery and equipment was used as a proxy to measure the adaptation of technology in the sector. Changes in real output per worker were used to capture the impact of investment in training. The rate of interest was used to potentially capture the impact of cost on investment expenditure. The share of gross investment in GDP was used as proxy for the overall level of investment in the sector. The impact of these factors on the sector was estimated for the period from 1983 to 2000 and yielded the following results.

$$MFG_{gr} = 0.13\ MImports + 0.20\ Irate + 0.44 LMprod - 0.52 GINV \qquad (4)$$

(2.57) (2.96) (3.73) (- 5.48)

$R^2 = 0.78$; R^2 adj. = 0.71; DW = 2.10

[*t* values are in parentheses]

where MImports represent, expenditure on imported machinery and equipment excluding transport and construction equipment and GINV, gross investment as a share of GDP. MFG_{gr} and Lmprod represent the annual growth rate of the manufacturing sector and real output per worker in the sector, measured as the first difference of the natural logarithms. The data are annual, and all variables are in natural logarithms.

As expected, imports of machinery and equipment, as well as labour productivity in the sector, had a positive impact on growth performance. On the other hand, changes in the overall level of investment in the economy, as represented by gross investment ratio, had a negative impact on growth performance. This might be indicative of the fact that changes in the level of investment in the manufacturing sector were not in keeping with the investment trends in other sectors, such as the financial sector and tourism. The financial sector, for example, recorded the most rapid rates of growth between 1987 and 1994 and might have accounted for a disproportionate share of investment expenditure. The interest rate variable was significant, but had the wrong sign. This might be indicative of the fact that increases in interest rates occurred at times when there was strong growth in markets for these products. This was the situation during the late eighties and early nineties when the growth performance of the sector was driven by expansion in the production of garments for the North American market.

It was pointed out in the previous section that labour productivity in the sector was relatively stagnant over the period and, indeed, rates of growth were negative on a number of occasions. The level of labour productivity would be determined by investment in training, as well as expenditure directed at

enhancing the quality of capital equipment for the work force. We will now turn to a consideration of the extent to which expenditure on imported machinery and equipment affected labour productivity. In addition, there will also be an assessment of the degree to which the cost and availability of funds might have possibly affected labour productivity, by restricting productivity-enhancing expenditure. Our estimate of the impact on labour productivity of the cost and availability of funds and expenditure on imported machinery and equipment yielded the following result.

$$\begin{array}{lll} \text{Lprodm} = & -0.188\text{Irate} + 0.187\text{Credit} & - 0.189\text{Mimports} \\ & (-1.82) \qquad (7.06) & (-1.97) \end{array} \qquad (5)$$

$R^2 = 0.83$; R^2 adj. = 0.80; DW = 2.19

[*t* values are in parentheses]

where Lprodm represents real output per worker in the manufacturing sector. The data are annual, covering the period from 1983 to 2000, and all the variables are in natural logarithms.

An increase in the rate of interest did, have as expected, a negative impact on labour productivity, the high cost of funds causing producers to economize on training and other productivity-enhancing investments. At the same time, an increase in the availability of credit would contribute to an increase in labour productivity by encouraging productivity-enhancing investment in training and the purchase of equipment. An increase in expenditure on imported machinery had a negative impact on labour productivity. Since an increase in the stock of machinery and equipment would normally be expected to increase labour productivity, this result is on the surface somewhat puzzling. However, increases in outlays on machinery and equipment will not be productivity-enhancing if it is not suited to the local environment. Moreover, it would also fail to enhance productivity if workers were not provided with the level of training required to operate the machinery efficiently. This lends further support to the notion that the labour productivity in this period might have been influenced more by the expenditures on imported machinery and equipment not ideally suited to the local environment than to overall expenditures on such equipment. In other words, it was a reflection on deficiencies in the quality of management decision-making in this area.

Meeting the New Competitive Challenge

It has been argued that the poor performance of the manufacturing export sector reflected some basic underlying weaknesses in the sector. These underlying weaknesses were re-enforced by certain aspects of monetary and fiscal policy and exchange rate management. In addition, there was a suggestion of deficiencies in the quality of labour and management. In looking to the future, one can see a situation in which operators in the sector are going to be confronted with changes in the domestic and international environment which will deepen the competitive challenges with which they will have to cope. Producers will be

faced with having to cope with less protection in the domestic market, given the conversion of government to the belief in the benefits to be realized from economic liberalization. In the international domain, the belief in the benefits of liberalization will be reflected in the drive towards hemispheric free trade and, in a much broader sense, the overall commitment to the advance of globalization.

It appears that in the area of the conduct of macro economic policy, there has been a recognition of the negative aspect of some of the policy initiatives undertaken in the recent past and the necessary corrective action is being taken. For example, the change in the approach to monetary management taken by the Bank of Jamaica, since 1997, where emphasis was placed on base money management as the principal inflation fighting tool, has succeeded in reducing inflation to single digit levels. This has helped reverse the steady appreciation in the real effective exchange rate of the earlier part of the decade.

The avoidance of misalignment in the real effective exchange rate is dependent on the effectiveness of the overall conduct of monetary and fiscal policy in assuring a reasonable level of price stability. There are those who have argued that there was a possible linkage between the exchange rate regime under which a country operated and the degree of discipline exercised by governments in the conduct of monetary and fiscal policy(DeKock and Grilli, 1993; Corden, 1994; Collins, 1996; Edwards, 1996). Alternatively, there are those who argue that since government policy decisions are usually taken after an assessment of the cost of various policy options, such cost considerations could rationally result in periodic departures from discipline in the conduct of policy (Aghveli, Khan and Montiel, 1991). An empirical investigation of the relationship between exchange rate regimes and prudence in the conduct of fiscal policy by CARICOM countries found no systematic difference in fiscal discipline across regime types (Seerattan, 2000). There does not appear to be a strong case for the Jamaican authorities to consider alternative exchange rate regimes in order to minimize the possibility of currency misalignment.

The punitive high interest rates which have dominated the Jamaican economic scene in the past decade are not consistent with the realization of significant positive rates of economic growth. More recently, the authorities seem to have attached a higher priority to bringing about a reduction in interest rates.

Let us now turn to the question of what ought to be done to address deficiencies in the quality of management and labour. These deficiencies are clearly indicative of inadequacies in the stock of human capital. Given the nature of the government's budgetary constraint, the funding requirements needed to overcome shortcomings in education and training cannot be borne solely by the government. A greater share of the burden will have to be borne by the business sector and in some instances by not-for-profit non-governmental organizations. Apart from what might be deemed the quantitative requirements, there will be a need to pay particular attention to shoring up gaps and deficiencies in curricula. The clearest need will be in the area of the new technologies.

However, over and above these investments in human capital, in order to meet the competitive challenge, there will be a need to create within the society an environment more conducive to innovation. There is a critical need for new ideas with respect to types of products to be produced and marketing strategies.

Romer (1992, 1993) has raised the issue of what he refers to as an idea gap, as a major constraint on development. He defines an idea gap in the following way:

> The notion of an idea gap ... includes the concepts that some authors have in mind when they speak of a technology gap, but it is intended to suggest something quite broad. The word technology invokes images of manufacturing, but most economic activity takes place outside factories. Ideas include the innumerable insights about packaging, marketing, distribution, inventory control, payments systems, transactions processing, quality control, and worker motivation that are all used in the creation of value in a modern economy (Romer, 1993, p. 544).

In addition, ingenuity reflected in an ability to bring fresh approaches to traditional methods of operation, will also be a factor of importance. This issue was highlighted recently by Thomas Homer - Dixon(2000). He outlined the unique role of ingenuity in the following way:

> Ingenuity ... consists not only of ideas for new technologies like computers or drought resistant crops but, more fundamentally, of ideas for better institutions and social arrangements like efficient markets and competent governments (Homer - Dixon, 2000, pp. 2 - 3).

If this new environment is to emerge, one which facilitates the generation of new ideas and ingenuity, there will have to be changes in the structure of governance. In essence, what is being referred to here are changes in the traditional modes of interaction among different groups in society. Barrett (1997), for example, refers to the importance of trust in making it possible for an environment conducive to encouraging innovative activity to emerge. The importance of trust is explained in the following way: "For individuals to interact willingly, innovatively, and continuously, they must posses trust in people and institutions - their business associates, the state, unions, or perhaps God - to safeguard them against catastrophe and exploitation, and to provide reliable information" (Barrett, 1997, p.554).

On a more specific plane, it has been pointed out that the basis of competitive advantage rests on innovativeness at the level of the firm (Hirst and Thompson, 1999). Such innovativeness, it is argued, is closely linked to such institutional considerations as the constitutional nature of company governance systems, the institutional operation of the labour market and the form of social settlement between social partners and organised interest groups. In a report by the Economic Commission for Latin America, it was noted that in the Caribbean, the nature of technical and social aspects of class relations among entrepreneurial, professional and technical workers and their ability to take concerted action to raise productivity was severely undermined by the poor quality of their representative organizations (Watson, 1994). Specifically, in Jamaica, it has been pointed out that the sharp class divisions that have historically characterized the society contributed to an especially rancorous relationship between management and workers, with a negative impact on productivity (Mullings, 1998).

How will the necessary changes be brought about? At a minimum, there will have to be a departure from the traditional hierarchical relationship between management and labour. These relationships reflect what has been the traditional form of interaction in the society at large between those who govern and those who are governed. Consequently, there will be a need to bring about a fundamental change in the society with respect to attitudes concerning the responsibility for articulating and finding solutions to the problems faced by the society. Essentially, what is required is a sense of shared community responsibility for the formulation and execution of measures geared to the realization of defined objectives. An appropriate step towards the realization of such an outcome would be to work to towards establishing strong community-based organizations at the centre of the policy development process. Dynamic community-based organizations will provide the appropriate environment for the generation of ideas and the development of novel approaches to the solution of problems. The experience gained in these organizations would have spill-over effects, which would be reflected in the behaviour of individuals in their work environment, as well as in other areas of social interaction.

References

Aghveli, B.B., M.S. Khan and P.J. Montiel.1991. "Exchange Rate Policy in Developing Countries: Some Analytical Issues." *IMF Occasional Paper* No.78

Barrett, Christopher. 1997. "Idea Gaps and Object Gaps in Economic Development." *The Journal of Developing Areas,*31 (Summer): 553 - 568

Collins, Susan. 1996. "On Becoming More Flexible: Exchange Rate Regimes in Latin America and the Caribbean." *Journal of Development Economics,* 51, 117 -138.

Corden, W.M. 1994. "Exchange Rate Policy in Developing Countries." In Richard C. Booth and Chorng - Huey Wong, *Approaches to Exchange Rate Policy: Choices for Developing and Transition Economies,* IMF Institute, Washington, D.C., International Monetary Fund

DeKock, Gabriel and Vittorio Grilli. 1993. "Fiscal Policies and Choice of Exchange Rate Regime." *The Economic Journal,* 103, 347- 358

Edwards, Sebastian. 1996. "The Determinants of Choice Between Fixed and Flexible Exchange Rate Regimes." *NBER Working Paper* No. 5756, Cambridge, MA., National Bureau of Economic Research.

Edwards, Sebastian. 1993. "Trade Policy, Exchange Rates and Growth." *NBER Working Paper* No. 4511, Cambridge, MA., National Bureau of Economic Research.

Edwards, Sebastian.1989. "Real Exchange Rates, Devaluation and Adjustment." Cambridge, MA: The MIT Press.

Hinkle, Lawrence and Peter J. Montiel.,1999. "Exchange Rate Misalignment: Concepts and Measurements for Developing Countries." New York: Oxford. University Press.

Hirst, P., and G. Thomson. 1999. *Globilization in Question,* Oxford: Blackwell.

Homer - Dixon, Thomas. 2000. *Ingenuity Gaps,* Toronto: Alfred A. Knop.

IMF. 2001. *Staff Country Report* No. 01/84.

IMF. 2000. *Staff Country Report* No. 00/19.

Krueger, A. 1978. *Foreign Trade Regimes and Economic Development: Liberalization Attempts and Con-sequences,* Cambridge MA: Ballinger Publishing Co.

Mullings, B. 1998. "Jamaica's Information Processing Services: Neo Liberal Niche or Structural Limitation"? in Thomas Klak, ed. *Globalization and Neo Liberalism: The Caribbean Context,* New York: Rowan and Littlefield.

Romer, Paul. 1993. "Idea Gaps and Object Gaps in Economic Development", *Journal of Monetary Economics,* 32, 543 - 573.

Romer, Paul. 1992. "Two Strategies for Economic Development: Using Ideas and Producing Ideas." Proceedings of the World Bank Annual Conference on Development Economics, 63 - 91

Seerattan, Dave. 2000. " Exchange Rate Regimes and Fiscal discipline in the Caribbean." *Social and Economic Studies,* 49 , 2&3, 109 – 137.

Watson, H.ed., 1994. *The Caribbean in the Global Political Economy.* London: Lynne Rienner

Williamson, John. 1983. *The Exchange Rate System,* Washington.D.C.: Institute for International Economics.

Section D:
Currency Risk and Prices

12

Past and Present Currency Board Experiments in Argentina

Esteban Pérez[1]

Abstract

The paper analyses currency board experiments in Argentina in two different time periods, 1899-1914 and 1991-2001. The 1899-1914 currency board system established a 'Conversion Caisse' ensuring the gold backing of all issues of paper money. More than a hundred years later in 1991, Argentina implemented a variant of a unilateral currency arrangement with the United States known as the 'Convertibility Plan', fixing the exchange rate at one peso per dollar, and providing close to full foreign currency convertibility for the money supply. Both monetary systems were implemented to guarantee the stability of prices and the exchange rate and ultimately designed to insulate monetary arrangements from government interference and political influence. Both currency boards lasted for a period covering close to a decade, were subject to external shocks and were ultimately marked by fiscal disequilibrium and foreign debt accumulation.

Both cases provide examples of instances where a monetary rule was put in place to mitigate the economic effects of a distributive conflict. Rather than seeking to replace the power of discretionary authority the rule was a substitute for a political or social institution. The analysis also reveals that a period of prosperity followed their implementation but that the underlying economic logic of both experiments is that of events unfolding in an ergodic environment. Furthermore, it shows that a rule can change the parameters on which agents base their decisions and is thus not neutral. Finally, it illustrates the importance of fiscal equilibrium but at the same time highlights the fact that it is the joint dynamics of the public and private sectors which set the stage for the demise of both currency board experiments.

---

1 ECLAC Sub-regional headquarters for the Caribbean (Port of Spain, Trinidad and Tobago). The opinions here expressed are the author's own and may not coincide with those of ECLAC.

Introduction

The paper analyses and compares two currency board experiments carried out in Argentina in two different time periods, 1899-1914 and 1991-2001. In the first case a currency board was put in place to avoid variations in the peso-gold exchange rate, which were detrimental to the interests of Argentina's economy and its exporters. The currency board regime fixed the exchange rate and a Conversion Caisse ensured the backing of fiduciary paper money issues. The 1991-2001 currency board regime was established to stop drastic price variations. It consisted of a Convertibility Plan establishing a one-to-one parity between the domestic currency (the peso) and the United States dollar. The plan allowed agents to undertake transactions in domestic or foreign currency and was accompanied by a set of market-oriented reforms.

Both currency board experiences share common traits. They brought about a change in regime and eliminated price and exchange rate fluctuations. Price stability and favourable external conditions set the basis for a period of economic prosperity that lasted for fourteen years in the case of the Caisse and five years in the case of the Convertibility Plan. However, in the latter case not all the main macroeconomic indicators were favourable to the currency board.

Both currency boards were confronted with external shocks. In both instances the monetary authorities tried unsuccessfully to confront the temporary disturbances. Nevertheless, their scope for manoeuvring was severely constrained by the fiscal position of the authorities and the fragility in the balance sheets positions of the private sector.

The Caisse faced the change in external conditions brought about by poor agricultural performance and the WWI conditions in 1914. In that year the convertibility scheme was suspended. The Caisse resumed operations in 1927 but was again faced with declining terms of trade and eventually the beginnings of the Great Depression. The Caisse was finally shut down in 1929.

For its part, the Convertibility Plan was challenged by the Mexican Crisis (1995), the Asian (1997) and Russian crisis (1999) and finally by the devaluation of the currency of a key trading partner, namely Brazil (1999). At the end of 2001, Argentina defaulted on its external debt servicing and the peso was allowed to float against the United States Dollar.

The study of both episodes sheds light on the main issues pertaining to currency boards. It also provides a critical basis on which to examine the conceptual and empirical underpinnings of monetary rules.

The paper is divided into four sections. The first one describes the 1899 monetary reform centering especially on the views of its progenitor the Minister of Finance Jose Maria de la Rosa. The second section analyzes the economic performance of the Conversion Caisse from 1899 to 1914 and from 1927 to 1929. The third section presents the conditions under which the Convertibility Plan was adopted, its main features, its evolution and its results. The fourth section extracts the lessons of these two monetary experiments. The conclusion reflects on the issues of monetary rules and the lessons that can be drawn for smaller economies.

The 1899 Monetary Reform

José María Rosa, the finance minister during the second presidency of General Julio A. Roca (1898-1904) formulated the Conversion Law of 1899.[2] The monetary reform of 1899 sought to suppress the effects of a fluctuating gold premium on the commercial interests of Argentina. The gold premium, which reflected the relationship between the internal and external value of the domestic currency, stood at 257% in 1894 and decreased to 125% in 1899. A rising gold premium favoured the economic interests of exporters while a falling gold premium favoured those of the importers (See Figure 1).[3]

Exporters made their payments for variable costs (wages, salaries, interests, and rents) in fiduciary money while they received their proceeds in gold. When the gold premium stood high their profits increased. In the opposite way a decline in the gold premium meant lower profits unless costs and especially wages could be brought down to reflect the new value of gold. In 1899, variable costs were esteemed to be rigid downwards and thus the disparity between prices and costs was inevitable causing a decline in exports and an increase in imports.[4]

This was the argument put forward by Rosa (1909). The decline in the gold premium affected fundamental economic interest of Argentina's economy, which were at the time exporter interests. More specifically Rosa (*op.cit.*, p. 70) made reference to agriculture and grazing activity (beef, wheat, corn, linseed, hides and wool), which dominated economic activity. In addition, but to a lesser extent, the finance minister pointed out to the negative effects on debtors and the working

---

2 Julio A. Roca was also President from 1880 to 1886. He belonged to the Partido Autonomista Nacional (PAN).

3 Williamson (1920) attributed the depreciation of the peso paper exchange rate (rise in the gold premium) during 1888-1891 chiefly to the cessation of borrowings and to excessive growth in the money supply. For the period 1894-1899, he considers that speculators and European Syndicates that had underwritten Argentinean securities had a temporary influence on the evolution of the gold premium and that the main explanatory variable is the favourable account on the balance of payments. According to Williamson, there is no association for this period between the gold premium and the money supply. Ford (1962) explains the decline in the gold premium (1897-1899) as a result of rising export volume and international prices. Other explanations at the time were founded on political events and expectations. Della Paolera and Taylor (2001) adopt a monetarist-rational expectations explanation and view the gold premium as being determined by a 'credible' fiscal and monetary policy in combination with favourable external conditions.

4 Ford (1962, pp.91-92) provides some evidence of the sluggishness in wage adjustment. Between 1894-1896, the gold premium declined by 17% and export prices by 2%. Urban nominal wages rose by 10%. In the same way between 1896-1899, the gold premium decreased by 13% and rural nominal wages remained constant. Curiously enough, the cost-price argument was a key component in the early quantity theory 'monetary disequilibrium' hypothesis. See Warburton (1966). It was also a crucial component of the 1930's Chicago monetary thought.

Figure 1
Evolution of the Gold Premium in Argentina
1890 - 1900

class caused by the slowdown of economic activity provoked, in turn, by the decline in exports and consequent increase in unemployment.[5]

Rosa discarded any solution to this problem based on a soft peg exchange rate regime. He explicitly stated that in situations of a falling gold premium a 'crawling peg-type' regime would simply recreate over time the disparity between costs and prices. Prices could adapt gradually to the fluctuations in the value of gold while costs would fail to adjust. As he put it (*op.cit.* p.98).[6]

> To establish a gradual falling exchange rate is to decree disequilibrium, the stoppage of economic life, the permanent crisis. Those who propose a gradual exchange rate assume, without doubt, that the law can decrease concomitantly, year by year or semester by semester, the prices of all goods and services. This is the most grave error; wages, rents, capital interests, the articles of national production... as is well known, are by nature refractory to the movements of gold and their changes proceed with extreme slowness...What will then happen with every decrease in the peso-gold exchange rate? A disequilibrium will occur between those values that are sensitive to gold changes and those that are refractory to the movements of gold...We will have a disequilibrium and a perpetual monetary disorder. Under such circumstances only the holders of cash balances would benefit from the decline in the value of gold and at the same time debtors would be ruined and the expectation of a further appreciation in the value of paper money would inhibit contractual obligations.

Rosa's main reform concern was the choice of the peso-gold exchange rate parity. He realized the dangers in establishing a parity that was too low or too high. Rosa was aware that a high peso-gold exchange rate, by discouraging exports, would negatively affect production and output and increase imports.

A low peso-gold exchange rate would have the opposite effects. In addition, it could lead to a deterioration of the state of public finances by increasing external debt obligations. The fiscal deficit had increased from 21 to 70 million of paper pesos between 1894 and 1898 and the development of Argentina's economy was highly dependent on foreign capital and loans.

At least by 1880, Argentina had accumulated sufficient imported capital to develop and transform itself "from a simple pastoral community to a modern close-knit agricultural nation, well equipped with railroads, ports, power and production facilities" (Peters, 1934, p.33). The economic transformation of Argentina was accompanied by an increase in the stock of external debt. Between

---

5 The negative effects of deflation were also highlighted by Silvio Gesell (1862-1930), a German economist who resided in Argentina from 1886 to 1900. Referring to the specific period of the end of the 19th Century in Argentina, Gesell stated: "..The increase in the value of money is the common cause for all the country's economic troubles.." (La Anemia Monetaria, 1898).

6 All English translations of Spanish references are by the author of this paper.

1887 and 1888 the stock of foreign debt increased by almost a 100% from 142 to 278 million gold pesos and by a further 33% between 1887 and 1891. In 1900 it had reached 447 million gold pesos (See Table 1 below).

Table 1
Argentina The deficit and the funded debt
(millions of gold pesos)1879 – 1900

Year	Revenues (1)	Expenditure (2)	Revenues/ expenditures (3)	Funded debt (4)
1879	21.0	22.5	93.3	77.7
1880	19.6	26.9	72.9	86.3
1881	21.3	28.4	75.0	107.1
1882	26.8	58.0	46.2	124.1
1883	31.0	44.8	69.2	128.0
1884	37.7	56.4	66.8	122.5
1885	26.6	40.5	65.7	113.4
1886	30.4	39.2	77.6	117.2
1887	28.2	48.2	58.5	141.7
1888	34.9	51.6	67.6	277.5
1889	38.2	55.8	68.5	295.2
1890	29.1	38.1	76.4	355.8
1891	19.5	33.7	57.9	370.1
1900	....	....	....	447.2

Note: .... Denotes not available.

Source: Peters (1934), p. 35.

For these reasons a return to the old parity would have been detrimental to Argentinean interests and would have caused an unwanted disruption in the economic life of the country. The alternative chosen by Rosa was to fix the parity at the on-going market rate. According to Rosa, this decision responded to expediency, to the needs of consolidating the existing state of affairs and to the erasing of the monetary past of Argentina.[7]

---

7 Rosa also defended this decision by citing the cases of France in the 19th century, Austria (1811 and 1819) and Russia (1839).

Rosa's monetary law was passed in 1899.[8] It consisted of six main features. First it preserved the gold peso created in 1881 and adjusted the paper peso to the existing premium of gold, corresponding to 127.3 %. The exchange rate was thus fixed at 44 *centavos* of gold for a paper peso.

Second, the law followed the Currency Principle and distinguished between an issue and a banking department. The functions of the issue department were assumed by the Conversion Caisse, which converted pesos into gold.[9] The Bank of the Nation, which held the excess gold reserves, assumed the functions of the banking department.

Third, it sought to establish a powerful gold base to guarantee the stability of the currency. This gold base was named the Conversion Fund. The conversion fund would draw its main resources from: (i) a 5% tax on imports; (ii) the profits of the Bank of the Nation; (iii) the earnings from the sale of a state owned railway; and (iv) the regular government budget.[10]

Fourth, it maintained the peso-gold parity through two mechanisms: the Conversion Caisse acted as an automatic regulator of the money supply and foreign exchange intervention. The Conversion Caisse guaranteed that any addition to the money supply should have a 100% gold backing. In the same way any withdrawal of gold would be accompanied by the withdrawal of an equal amount of paper pesos. The Bank of the Nation carried out foreign exchange interventions by exchanging its gold reserves for the peso notes of the Conversion Caisse. In this way the system sought to provide elasticity to the money supply, avoiding temporary excesses or shortages of currency that could undermine the functioning of the Caisse. The Bank of the Nation could also function, to some extent, as a lender of last resort.[11]

---

8 The precise date is 31 October 1899.

9 The Conversion Caisse was administered by a board of five directors appointed for a period of five years by the executive and subject to the approval of the Senate.

10 According to Della Paolera and Taylor (2001, p.120), the Conversion Office was not able to generate the required gold backing for paper issues: "The level of specie reserves at the Conversion Office throughout the period 1891-99 was zero...In the end, under the constraints of no fiscal resources...and no specie whatsover –and in a leap of great faith- the law went into effect anyway." According to both authors the required reserves were obtained only by 1910.

11 Ford (1962, p.103) writes: "Besides using the Conversion Fund to smooth out temporary fluctuations in the foreign exchange rate market, the Bank of the Nation, which held a much larger amount of gold in its vaults than its gold peso liabilities, would, in the event of heavy seasonal gold shipments by other banks which had obtained the gold by depositing paper notes in the Caisse, at its discretion, pursue the opposite course and deposit gold from its vaults in exchange for notes at the Caisse. Thus, if other banks were unwilling to grant loans or discounts because of inadequate cash reserves, the hard-pressed merchant might obtain funds from the Bank of the Nation. This offsetting policy was limited by the extent to which the Bank was prepared to run down its gold holdings, and by the size of its Conversion Funds...". Della Paolera and Taylor (2001, p.120) consider that the monetary law suppressed the function of lender of last resort.

Fifth, the law contemplated the decline in government expenditure to ensure an equilibrated state of public finances. The contraction in government expenditure was achieved by curtailing public salaries and wages by 10%. Finally, the authorities would ensure the decline and eventual extinction of the floating debt of Argentina.

The Performance of the Conversion Caisse

The Conversion Caisse functioned smoothly between its coming into force in 1900 and 1912-13. In 1914, unfavourable external developments led to the suspension of convertibility and the closing of the Caisse. The Caisse resumed operations in 1927 but was finally shut down in 1929 as a result of a gold drain driven in part by an unsustainable foreign debt burden.

Between 1899-1912, fair weather conditions facilitated the operations of the Caisse. The terms of trade were favorable for Argentina's agricultural export products (See Table 2), which in turn improved the credit rating of the country. This responded to the fact that the country's foreign credit base depended on the value of its main exports. As put by Peters (1934, p.50):

> The picture is amazingly simple; the basis of the nation's prosperity lies almost entirely in agricultural and grazing products. With its beef and wheat, corn, linseed, hides and wool, the country pays for all that it imports from abroad, and it is upon the value of these commodities that its credit rests....As a result it is not at all an unfamiliar spectacle to find the credit of the entire nation measured in the exchanges of the world with complete reference to the value of a single commodity – wheat...When grains and meat are high so are the Argentine bonds.

As a result the authorities were able to substitute short-term for long-term foreign debt. They also obtained loans under very favourable conditions such as the Public Works Loan of 1909 and the Internal Gold Loan of 1911 which were payable in gold at fixed exchange rates.

At the same time this state of affairs led to a favourable outturn in the balance of payments and an increasing level of gold stock guaranteeing the safe functioning of the Conversion Caisse. Between 1900 and 1914, total exports grew on average 8% (the main categories of exports such as grain and grazing exports increased 12% and 7% respectively) and imports 12%. However, in every year with the exception of 1911, the result of the trade balance remained positive and yielded on average a surplus of 59 million gold pesos.[12] The surplus in the trade balance and the capital inflows (estimated at 40 million gold pesos annually) allowed the country to service its foreign debt obligations and to obtain a surplus in the balance of payments. Estimates by Martinez and Tornquist show a surplus of 27, 39, 159 and 30 million gold pesos in the balance of payments for the years 1904, 1908, 1914-15 and 1915-16.

---

12 According to Williams (1920) the trade surplus ranged between 10 and 118 gold pesos, averaging 75 million pesos.

Table 2. Argentina: Economic Indicators1900 – 1914

Year	Real Output (1)	Trade Balance (2)	Net imports of gold (3)	Actual note creation as a percentage of potential note creation (4)	Infla-tion (5)	Fiscal deficit as percent-age of GDP (6)	Terms of Trade (7)	Differential interest rates of domestic debt and UK consols (8)	Issues on London Stock Exchange for Argentina (9)
1900	9,430	42	6.7	95	....	0.6	100.0	2.6	7
1901	10,220	54	0.1	95	-12.0	0.7	88.9	2.3	25
1902	10,020	76	5.8	93	9.1	3.2	97.0	2.3	16
1903	11,450	90	24.5	100	-5.2	0.4	91.0	2.2	26
1904	12,670	77	23.3	96	2.2	0.4	92.1	2.1	21
1905	14,350	118	31.7	104	8.6	0.0	100.0	2.1	61
1906	15,070	22	16.6	104	5.9	0.2	104.9	2.1	63
1907	15,390	10	20.4	98	2.8	0.1	105.8	1.9	72
1908	16,900	93	28.6	97	-3.6	-0.1	103.9	1.9	80
1909	17,730	94	65.7	92	9.4	2.5	112.6	1.8	109
1910	19,020	21	35.3	88	7.8	3.0	117.9	1.7	115
1911	19,370	-42	9.8	87	-0.8	3.1	115.9	1.6	84
1912	20,950	95	35.9	87	2.4	1.6	115.5	1.5	101
1913	21,160	63	3.6	88	0.0	1.5	113.4	1.5	60
1914	.....	77	-13.3	83	0.8	....	113.3	1.6	76

Sources: Ford (1962); Williams (1920); Nakamura & Zaragaza (1998) and Della Paolera and Taylor (2001).

Note: (1) Refers to a real output index in millions of 1950 pesos; (2) and (3) are expressed in millions of gold pesos; (4) Obtained by dividing actual note issue by the note issue creation of net gold imports; (5) Inflation refers to the rate of change of the Wholesale Price Index for Argentina with 1900=100; (6) refers to the fiscal deficit deflated by the wholesale price index divided by the real output index; (7) calculated as the ratio of Argentina's Wholesale Price Index to the UK's Consumer Price Index; (8) refers to the difference between interest rates of domestic debt and UK consols.

As a result the imports of gold also showed a rising trend, evident especially from 1903 to 1910, which translated into a net increase in the net gold holdings of the Conversion Caisse. This is illustrated in Figure 2, which plots the net imports of gold and the net increase in Caisse Holdings (the simple correlation coefficient is 0.73). A similar picture emerges from the fact that the actual note creation as a percentage of the potential note creation based on the net gold imports (shown in Table 2 Column (3)) was equal or greater than 96% between 1903 and 1908 (Ford, 1962, p. 98).

In accordance with the performance of the external accounts real GDP grew on average by 7% between 1901 and 1912. For the same period inflation remained subdued at 2% and the fiscal result (1.3%) benefited from higher trade tax revenues (See Table 2 above) and a decline in the foreign debt service due to higher export prices (Ford, *ibid,* p. 156). This state of prosperity was accompanied by lax commercial bank lending and greater speculation, particularly in land and property. Between 1904 and 1913, real estate prices increased by 350%.[13]

Thus, in summary, the overall economic context allowed the 1899 monetary law to meet its objective. The regime was able to maintain a fixed gold-peso exchange rate. At the same time, it succeeded in abolishing speculation regarding the future value of the gold and thus the fluctuations in the gold premium, thereby putting an end to the distributive conflict, at least temporarily, affecting exporters and importers.

Seven years after the start of operation of the Caisse, Rosa expressed satisfaction with the results obtained. As he put it (*op. cit.* pp. 162-163):

> We could say that we have today a stable and healthy national currency that represents the wealth of the country...that increases or decreases according to the needs of the country and aids the movements in public wealth, a currency that has produced the great benefit of having money at the low rates of interest of industrialized nations, a currency that stimulates commerce and trade and that is the most potent element that concurs to our progress.

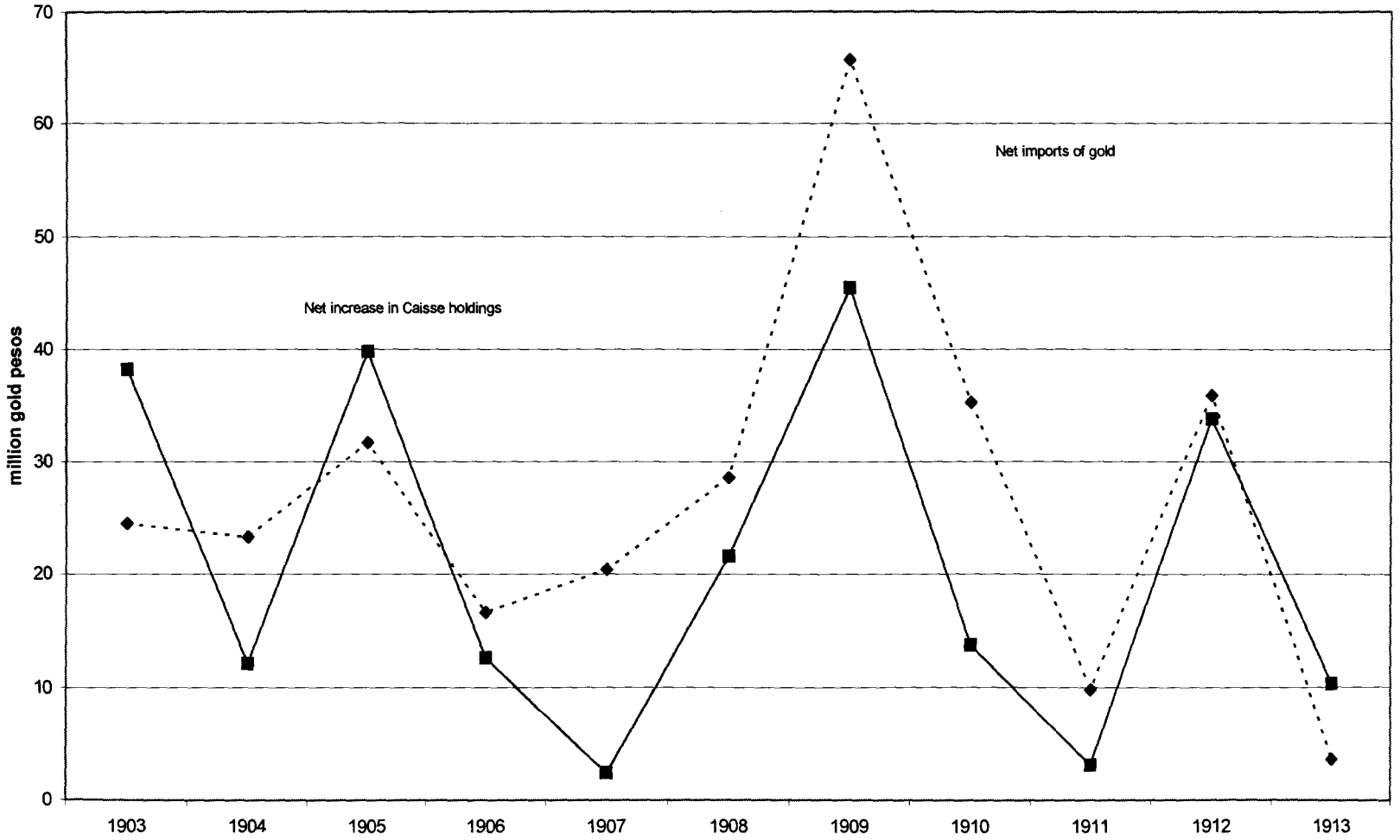
However, at the same time he was well aware that a currency board, under 'foul weather' conditions, could be the source of violent fluctuations in the value of the currency, thus undermining its very foundation. Rosa stated *(ibid):* "In the situation which we find ourselves it is true that a crisis, produced by disorderly speculations, a panic, a political commotion could bring violent contractions in our monetary market, bringing the end of the Conversion Caisse and the return to inconvertibility...." [14] In order to avoid situations such as a flight from fiduciary

---

13 Real estate prices are measured by " the price per square meter of residential properties in Buenos Aires." Della Paolera and Taylor, p.128.

14 Similar concerns were voiced by Silvio Gesell: "Our money is so intimately and solidly linked to gold, as the pound sterling is and even more so than the franc or the mark...If, in some faroff country with a gold standard, a crisis develops, this crisis will have immediate repercussions for the Argentine paper currency...He that enjoys the advantages of an international money must also accept its inconveniences, the pros and cons of monetary solidarity." (quoted in Della Paolera and Taylor (2001), p. 129).

Figure 2
Net Imports of Gold and Net Increase in Caisse Holdings in Argentina
1903 - 1913



paper to gold, Rosa urged that the gold reserves of the Caisse be increased. Only then would the public be assured of the full gold backing of the paper currency at all times.

Rosa's premonitions were not unfounded. In 1913-1914, the Caisse was subject to severe external pressures, turning a virtuous economic cycle into a vicious one.

Argentina suffered a failure of the cereal crop representing close to 50% of the country's total exports. This had a negative effect on agricultural exports. Cereal exports declined by –43% between October 1912 to September 1913 (322 million gold pesos) and October 1913-September 1914 (182 million gold pesos). The fall in export production affected not only the balance of trade position but also had a depressing effect on land values and thus on capital outflows. This last effect was reinforced by the need to finance the war efforts of European countries, which dried up Argentina's external sources of finance. As shown in Table 3 below, these were instrumental in guaranteeing a positive overall balance of payments equilibrium and the necessary reserves for the smooth functioning of the Caisse.

Table 3
Argentina's Balance of Payments1911-1914
(October to September)
Millions of Gold Pesos

	1911-1912	1912-1913	1913-1914
Balance of trade	20	52	12
Debt service	-168	-161	-139
Tourism and remittances	-87	-87	-38
Current account	-235	-196	-165
Capital account			
Net gold movements	35	35	-13
Δ Foreign debt	200	161	178

Ford (1962), p. 173. And author's own estimates.

The unfavourable balance of payments result caused a contraction in the liquidity of the financial system, which responded pro-cyclically by increasing the reserve ratios of commercial banks. In turn, the decrease in the money supply had a negative effect on income and employment and resulted in a plummeting of asset prices (land values).[15] It also aggravated the financial situation

15 Dell Paolera and Taylor (2001) report that in 1914 asset prices responded with a great degree of flexibilty to the restriction in the supply of foreign capital and fell by 33% in one year. Note, *in passim*, that Paul Krugman traces the Thai Crisis (1997), in part, to land and property speculation and the ultimate drastic decline in their prices.

of the farmers affected by the poor climatic conditions, thus impinging on the recuperation of exports and land values. This provided a further blow to the confidence of foreign investors. Two examples illustrate this point. The shares of the Spanish Bank declined from 200 to 150 between January 11, 1913 and July 4, 1914 and the ordinary shares of *Edificación Argentino* followed the same trend from a peak of 157 in January 1913 to 79 at the end of March 1914 (Williams, 1920).

Imports responded rigidly to the decline in income and with a lag thus aggravating the fluctuations in the downward phase of the cycle. Imports were rigid because they included, among others, raw materials, machinery and final goods, which were essential for on-going production and consumption.

In addition, as pointed by O'Connell, (1984, p. 192): "... import demand...revealed a rather perverse lagged response which meant that it would remain at a high level even after exports and the level of activity were falling, thus creating thus a severe external payments problem in the downward phase of the cycle."

Imports eventually responded and the effect was positive for the external position. But this was not the case for domestic finances. Import duties represented more than 53% of all government revenues (Peters, 1934, p. 68). Their fallout translated into a fiscal deficit. Between 1913 and 1941, government revenues fell -24% and the deficit increased four-fold, from 14 to 60 million gold pesos (See Table 4 below).

The consequences of the liquidity shortage made it difficult to maintain the backing and convertibility of the currency. In August 1914, gold payments were suspended and the Conversion Office was closed. In that month the authorities passed an emergency law allowing the Bank of the Nation to engage in rediscounting operations with the financial system. The law also gave the Conversion Office a rediscounting facility.[16] Argentina did not return to a gold standard regime until 1927. The decision was again linked to the impinging appreciation of the peso and the unfavourable consequences for exporters' interests (Fuentes, 1998).

In 1927 the peso returned to par with gold. However, starting in 1928 the convertibility scheme was confronted again with unfavourable external conditions. The monetary authorities tried to respond differently from the way they did in 1914, using their reserves to finance gold exports.

From 1928 to 1931, Argentina faced unfavourable terms of trade for its export products. For that period according to O'Connell (1984, p.196) export prices declined by 64%. As a result, as in 1914, gold reserves would have declined directly. However, contrary to the earlier Caisse period, this did not translate into a contraction in liquidity. The monetary authorities had sufficient reserves

---

16 The Conversion Office did not make use of its rediscounting prerogative until 1931. Della Paolera and Taylor (2001) see the start of discounting by the Conversion Office as the most important monetary event of the 1930's. Raul Prébisch played an instrumental role in putting in motion the rediscount law, setting the stage for a smooth transition to a fiduciary monetary regime. (*ibid,* p.218).

Table 4
Exports, Exchange Rate, Government Revenues and Expenditures, 1927 – 1931

Year	Grazing Exports (1)	Agri-cultural Exports (2)	Total Exports (3)	Unit Value (4)	Exchange Rates (5)	Re-venues (5)	Expendi-tures (6)	Deficit (7)	Total Debt (8)
1927	1650	16263	18740	53.8	0.9630	.....	.....	.....	281.8
1928	1323	15010	17029	62.0	0.9648	319	389	70	289.8
1929	1268	14761	16703	59.4	0.9513	348	436	88	289.8
1930	1212	9279	11027	55.7	0.8551	324	482	158	339.8
1931	1149	16877	18477	34.7	0.6674	336	390	54	309.8

Source: Peters (1934).

Note: (1), (2) and (3) in thousands of tons. (4) Unit values were obtained by dividing total export values expressed in millions of pesos divided by export volumes expressed in millions of tons. (5) The exchange rate refers to the ratio of United States and Argentina wholesale prices (1926=100). (5) and (6) are expressed in millions of gold pesos. (7) Refers to the difference between (5) and (6). (8) Refers to the sum of funded and floating Argentine debt in the United States expressed in millions of dollars.

..... Denotes not available.

accumulated during 1927-1928 and decided to intervene to maintain the convertibility by financing the concomitant export of gold without causing a liquidity contraction. More precisely, the Bank of the Nation used its own reserves to pay for gold exports. This allowed banks to expand credit and thus undertake a counter-cyclical monetary policy. This scheme was eventually faced with failure due mainly to the restrictions imposed on the expansion of credit by the floating debt of the government.[17]

The 1991 Convertibility Plan

In the following decades and especially after WWII the focus of development turned from agriculture to manufacturing and capital accumulation. The urban-rural divide replaced the opposing interests of exporters and importers. At a later phase, the conflicts within the urban social strata took centre stage. The outcome

17 See Peters (1934) , p.156: "The decision to abandon the gold standard..was greatly influenced by the large amounts of government paper held by the banks."

turned out to be a history of persistent inflation that reached its climax at the end of the 1980s. During this whole period opposing interest groups alternating in government made different demands on society and the economy that were reflected in inconsistent relative prices and bypassed ultimately through fiscal deficits and inflationary processes. In 1989, following inflation stabilization attempts, the Central Bank president of Argentina remarked:

> Low inflation has never been a public good. Labor union leaders, some entrepreneurs, the Peronist Party, the administrators of public enterprises, the governors (of the provinces)...did not conceive of economic stabilization as something that needed to be defended everyday. In this context the stabilization was an impossible task for a technocratic elite...whose effective influence was confined only to some segments of the central power.[18]

Following very high price surges in that year (1989) sold to the public as "a hyperinflation episode," Argentina chose to implement in 1991 a variant of a unilateral currency arrangement with the United States, known as a currency board.

The events that led to the adoption of the currency board are well known. Following a military dictatorship in the 1970's, a democratically elected government took office in 1983 and identified the control of inflation as its main priority. Inflation which was running at 400% a year was confronted with the standard orthodox remedy, namely, demand restraint. The failure of these policies led the government to the adoption of a stabilization plan termed the Austral Plan (1985-1987). It combined wage, price and exchange freezes with fiscal and monetary reforms. Despite the early success of the Austral Plan and the implementation of three other stabilization plans inflation could not eventually be brought under control. The monthly rate of inflation reached 38% in August 1988, 200% in July 1989 and an average of 79% in the first trimester of 1990 (See Figure 3).[19] These high rates of inflation were accompanied by the deterioration of public finances, external disequilibrium, and capital flight. Moreover, the shift in the composition of agent's portfolio from peso-denominated to dollar-denominated assets due to currency depreciation endangered the stability of the financial system.

Within this context, the newly appointed Finance Minister of the Carlos Menem government who took office in 1990, Domingo Cavallo, introduced the Convertibility Plan in April 1991. The plan was intended as a regime change and had most of its

---

18 Quoted in Wynia (1992). The quote is by Jose Luis Machinea who was President of the Central Bank of Argentina from 1986-1989.

19 These stabilization plans are the Primavera (1988), the Bunge and Born (1989), and the Bonex Plans (1990). Bunge and Born were two executives of a multinational corporation and the Bonex plan was masterminded by the Economics Minister Erman González (December 1989 to March 1990) of the Menem government.

characteristics, that is, paraphrasing Sargent (1982, p.42), the plan required more than just a few temporary measures of fiscal and monetary restraint.

Thus it consisted of a change in the policy regime and more specifically of an "abrupt change in the continuing government policy, or strategy as to be widely believed."[20] It was aimed at restoring the confidence in the currency while postulating a break with the past behaviour of inflation, that is, with the inertial behaviour of inflation. The change in regime embedded in the plan paid particular attention to the way in which the government approached the management of public finances.

The plan fixed the exchange rate at one peso per dollar and gave agents the possibility of freely using the dollar or the peso to settle monetary transactions.[21] Concomitantly the law suppressed foreign exchange controls, permitted the settling of contracts in foreign currency and prohibited indexation clauses in the terms of contracts. The law provided close to full foreign currency convertibility for the money supply. The law permitted that up to 10% of the money base could be backed by dollar-denominated government bonds. This made it illegal for the authorities to issue currency without foreign exchange backing and transformed the Central Bank into a quasi-monetary monetary board.[22] Also the convertibility law forbade the alteration of the exchange rate parity and Central Bank lending to the government.

The convertibility plan was supported by a set of key measures which were meant to reflect changes in 'fundamentals.' These measures responded to the so-called 'necessary preconditions' for adopting and defending a currency board. These consisted of a set of measures to liberalize and deregulate the economy, expose the productive apparatus to competition and privatize the government's resources.

The average tariff rate was reduced from 22% to 11% between 1991 and 1998, price controls were abolished and traditional sectors, such as the mining sector, were opened to foreign capital. The privatisation of state-owned assets began in 1990 with the sale of the telephone company (ENTEL) and the national airline (Aerolíneas Argentinas). Other industries affected by privatization included the state petroleum company, electricity, gas, transportation, water utility, and petrochemical plants (Baer, Elosegui, and Gallo, 2001).

---

20 Sargent's original quote conceive of the "government policy for setting deficits now and in the future sufficiently binding as to be widely believed." The change in regime brought about by the Covertibiltiy Plan is seen in a broader context although particular attention is paid to fiscal factors.

21 Cavallo (1996, p.176-177) considered the freedom to choose the currency in which contracts should be settled as a key feature of the stabilization plan since, as he put it, it "sustained the prohibition on monetary corrections or indexation clauses in contracts. This was very important to the elimination of all vestiges of inflationary inertia in the system."

22 Unlike the Argentine currency boards, the more orthodox currency boards normally do not have a central bank and leave no room for discretionary monetary policy.

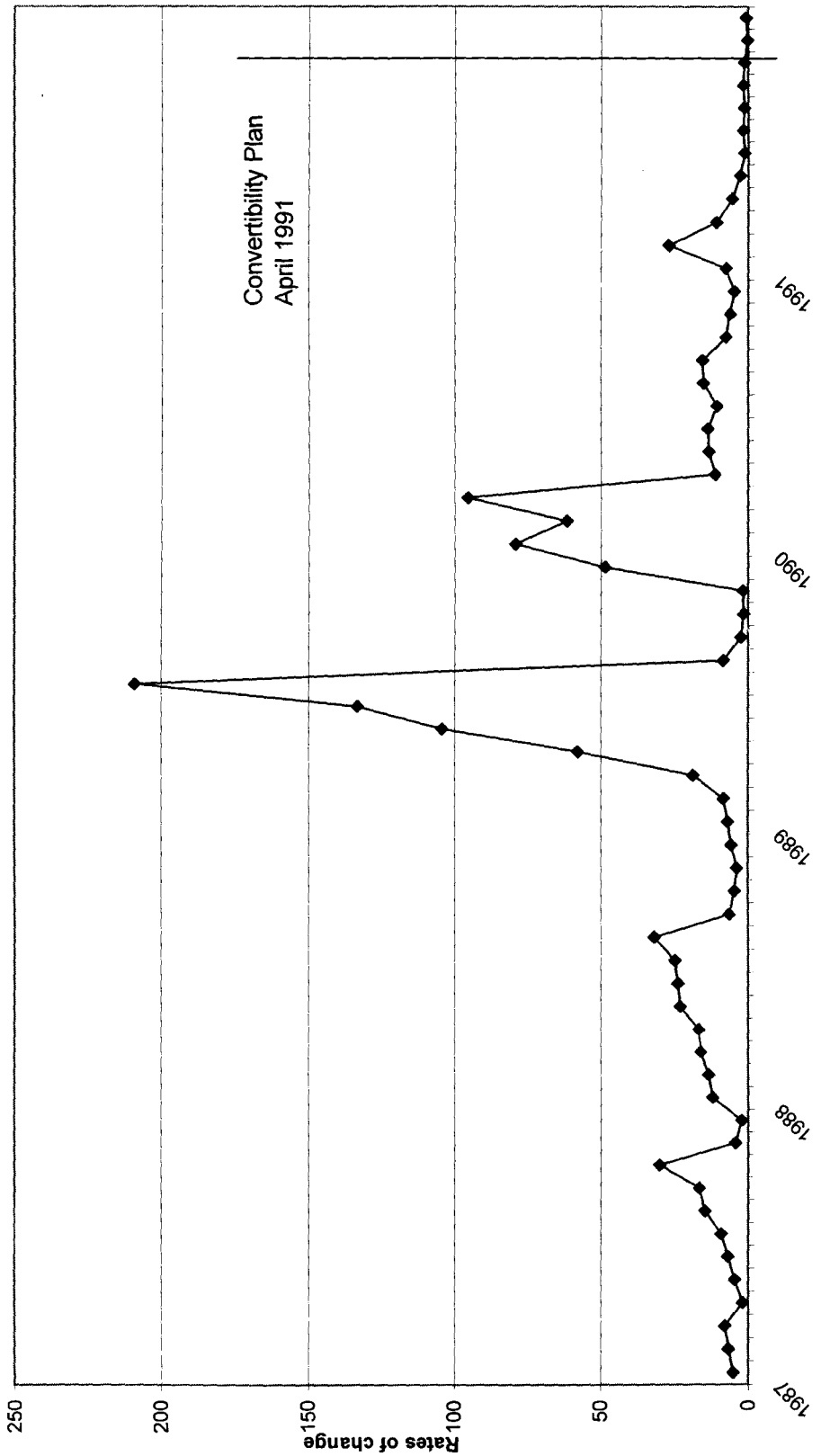


Figure 3
Monthly Rate of Inflation in Argentina
1987 - 1991

Table 5
Argentina: Macroeconomic Indicators, 1989 – 2001

Year	GDP (1)	Inflation (2)	Fiscal Deficit (3)	Current Account Deficit (4)	External Debt (5)	RER (6)	FDI Rate (7)	Unemployment (8)	Real Wage (9)
1989	-6.6	3,079.5	-2.7	-1.7	....	....	...	7.7	....
1990	-0.5	2,315.5	-1.6	3.3	....	.....	.....	7.4	103.2
1991	10.0	172.1	-0.3	-0.2	32.3	....	....	6.5	94.6
1992	9.5	24.9	0.9	-0.1	27.4	103.5	3218	7.0	98.6
1993	5.7	10.7	-0.3	1.5	28.0	95.4	2059	9.6	100.0
1994	7.5	4.1	-1.4	-0.3	30.4	94.6	2480	11.5	101.9
1995	-5.0	3.4	-2.2	-0.6	35.2	100.0	3756	17.5	96.8
1996	5.5	0.1	-1.4	-1.9	36.9	101.9	4937	17.2	97.1
1997	8.1	0.3	-1.2	-1.5	42.6	98.6	4924	14.2	93.6
1998	3.8	0.7	-1.6	-1.4	47.1	95.7	4175	12.9	92.6
1999	-3.4	-1.8	-1.7	-4.4	51.5	89.1	22633	14.2	97.5
2000	-0.8	-0.7	-2.4	-3.1	51.8	89.6	10553	15.0	94.5
2001	-4.5	-1.1	-3.5	-1.6	....	87.1	3500	17.4	....

Source: ECLAC (2001-2002); Bauer (2001); Cavallo (1996); IMF Financial Statistics. Several Issues.

Note: (3), (4) and (5) are expressed as percentages of GDP. (3) refers to the result of the non-financial public sector. (7) is expressed in millions of US dollars. (1), (2) and (8) are expressed in percentages. (6) refers to the real exchange rate of imports. In (9) the base year is 1990.

.... Denotes not available.

This market-oriented strategy was accompanied by measures to strengthen the state of public finances. Tax increases and decreases in government expenditure were decreed. Public sector employment was downsized by 20%, and public sector wages were frozen.

The government also liberalized the financial system. From 1994 onwards, it allowed foreign financial institutions to compete with locally owned ones. The share of foreign bank deposits in total deposits increased during 1994-1998 from 26% to 41% of total deposits.

The overall results of the Covertibility Plan were mixed. Initially the prospects appeared to favour the adoption of the Plan. As in other stabilization plans inflation abated abruptly, growth resumed and the main macroeconomic variables were in sync.

These positive aspects were counterbalanced by real exchange rate appreciation, rising unemployment and lower real wages, increases in interest rates, and eventually unsustainable foreign debt stock levels.

Both aspects are not in fact contradictory effects of the Convertibility Plan but are fitting parts of its coherent overall strategy. Initially the plan restored agents' confidence in the currency and the economy. The monthly rate of inflation that had reached levels above 50% in 1989 (April to July) declined to 0.7% by the end of 1991 and price fluctuations were virtually eliminated.

The decline in inflation coupled with higher nominal interest rates increased real interest rate levels. Interest rates rose from 3.1% in 1993 to 10% in 1996. The effect of interest rates was asymmetric. Domestic productive activities were penalized while activities directed to foreign investment levels were rewarded by higher rates of return. As a result, the country experienced high levels of capital inflows which were reinforced with official financial assistance from multilateral organizations. Foreign direct investment and the international reserves more than quadrupled between 1989 and 1994 (4 and 18 billion dollars respectively).

A greater part of foreign direct investment originated in purchases of domestic companies' shares by non-residents, that is, it reflected the privatization initiatives of the government. Thus, at the same time that foreign direct investment increased, government receipts rose *pari passu*. Jointly with expenditure restraint and tax increases this led to a change in the budget position from a deficit of 8% in 1989 to a surplus in 1992. In addition, since foreign direct investment was mainly channelled in domestic existing activities it affected the ratio of investment to GDP, increasing from "13% to an average of 22% between 1993-1999" (Baer *et. al.*, 2001).[23] A concomitant result was the sudden increase in productivity mirroring the behaviour of investment (12% between 1989 and 1992 and 14% between 1992 and 1994).

GDP growth reflected this state of affairs. Economic growth which was negative in 1989-1990 (negative 6.6% and negative 0.5% respectively) soared to 10% in 1991. Between 1991 and 1994 GDP grew at an average annual rate of 7.7%.

This performance was undermined by the appreciation in the real exchange rate, and eventual deterioration of the government's finances. Also the increase in interest rates led the private sector to adopt risky financial positions.

Real exchange rate appreciation reflected the overvaluation of the United States dollar during the decade of the 90's and also the level of domestic prices at which the government pegged the exchange rate. That level of prices was too

---

23 According to Baer *et. al.*, the privatisation process was also accompanied by a concentration of assets: "The result of privatizations of 1991-1994 was that 66% of the privatized companies made their appearance on Argentina's list of the top 200 companies. And 50 companies of the newly privatized group soon accounted for 60% of total profits of the top 200 firms and ...in 1995 just three of these privatized firms accounted for 40% of the total turnover of the seventy companies listed in the Buenos Aires stock exchange." This concentration of wealth jointly with the increasing rates of unemployment for some sectors account for the growing inequality in the distribution of income (the Gini coefficient changed from 0.49 to 0.45 in the period 1989-2000) and the consumption patterns.

high to guarantee a competitive edge for the economy. Indeed, the real exchange rate had an immediate tendency to appreciate, causing an important external disequilibrium and forcing the authorities to rely on several occasions on quantitative controls as a substitute for devaluation. In addition, high interest rates and capital inflows also contributed to the appreciation of the exchange rate.

The chosen solution to increase exchange rate competitiveness, which turned out to be unsuccessful, was to induce a decrease in costs by decreasing the price level through nominal wage restraint. Strong labour unions impeded the decline in wages and in fact, as pointed out by Baer *et al.:* "From 1991-1994 the real wages of professionals increased by 46%, those of skilled and unskilled workers grew by 27.2% and 16%." Real wages in fact finally declined (11% and 16% for skilled and unskilled workers) in 1995 at the peak of the unemployment rate (17%) which coincided with the Mexican Crisis.

The real exchange rate appreciation was detrimental to the balance of trade position and increased the country's dependency on foreign capital, feeding back into the appreciating trend of the exchange rate. Furthermore, the evolution of the fiscal situation reinforced the need for foreign capital.

Between 1993 and 1999, the government expenditures increased from 15.9% to 17.2% of GDP while income declined from 16.3% to 14.1%. The government was unable to adjust the level of expenditure to that of income, creating a perennial for financing. Since the law forbade the Central Bank to lend to the government, the government sought foreign financial sources.

The decomposition of fiscal expenditure showed that the only relevant change was the decline in current transfers (25% and 20% in 1993 and 1999) as a result of the sale of state-owned assets and the increase in interest rate payments. Interest payments as a percentage of total expenditure increased from 7% to 17% during the same period. This reflected a growing level of indebtedness. External debt as a percentage of GDP increased from 32% to 51% between 1991 and 1999. In the same vein between 1993 and 1999 the external debt service rose from 22% to 35%. The debt burden was eventually reflected in the widening of the interest rate differential between the Argentine dollar interest rate and that of the United States Treasury Bill rates - measuring the compensation for perceived risk of default - which by May 2001, reached levels similar to those of strife-ridden African countries.

These weaknesses did not endanger the viability of the Convertibility during most of the decade of the 90's and in fact, despite a rising unemployment rate (7.7% and 12% 1994-2000) Argentina's quasi currency board commanded a broad base of support. This responded in part to the growth prospects of the economy, the historical memory of inflation.

Most importantly, it resulted from the growth in dollar-denominated debt and dollar-denominated assets. In 1997, 64% of all credit granted by the banking system was denominated in dollars. In addition, besides the public foreign debt, the private sector issued $9 billion worth of bonds in foreign currency with short maturity periods (less than 5 years). The currency board created, in fact, an atmosphere of certainty that stimulated risk-taking and the expansion not only of public but also private indebtedness in the belief that "dollar contracting fixes

at the same time the foreign currency value of claims and the domestic real value of obligations" (Fanelli and Heyman, 2002, p.12).[24]

From 1994 to 1999 the Argentinean economy was confronted with two important external shocks: the Mexican 'Tequila effect' and the Russian and Brazilian crises that followed the Asian debacle. The last shock led to the abandonment of the parity between the peso and the dollar and the currency board arrangement.

The Mexican 1994 devaluation and the economic crisis that followed undermined investor's confidence in emerging markets and provoked important capital outflows and threatened currency stability. Initially, Argentina followed the 'rules of the game' imposed by the adoption of a currency board. Capital outflows resulted in heavy reserve losses (the Central Bank lost a third of its international reserve stock), a decrease in both peso and dollar deposits and a contraction in the rate of growth of money supply which resulted in an increase in the interest rate structure.

These effects were compounded by the decision of international banks to suspend the credit lines to their Argentine branches on the basis of an increase in the perceived country risk, forcing these to turn to the domestic market for funds, which further increased the rate of interest. At a more fundamental level, the search for funding in the domestic financial market was interpreted as a signal of a systemic banking failure and contributed to triggering a run not only on peso but also on dollar denominated deposits.

However, the government and Central Bank did not by any means remain passive and eventually took action to avoid the collapse of the convertibility scheme. They increased bank liquidity by reducing reserve requirements, approved an amendment to the Central Bank law which allowed it to act as a lender of last resort to troubled institutions, and contributed to the establishment of a privately financed deposit insurance fund. Finally, the creation of the Fiduciary Fund for Provincial Development to privatize provincial banks permitted the restructuring and consolidation of the financial system. After the Mexican crisis, the lender of last resort function was partly restored in a permanent way to the Central Bank by the provision of the Contingent Repurchase Facility allowing the Central Bank to sell assets with a repurchase clause (Repo option).

The Asian and Russian crisis (1998-1999) and the devaluation of the Brazilian real that followed in 1999 provoked a confidence crisis, a severe loss of competitiveness in Argentina *vis-à-vis* its main trading partner (Brazil) and a decrease in its terms of trade. The resulting recession lasted was long-lasting and cast serious doubts on the ability of Argentina to confront its external debt obligations (14 billion dollars) due in 2001. In addition, the government's margin of action was constrained by a deteriorating fiscal balance which left it no choice but to pursue contractionary policies. These, in turn, compounded the expectations of a stagnant economy.

---

24 See also Kregel (2003).

Table 6. Financial Indicators, 1992 – 2001

	1992	1994	1996	1999	2001
Dollar deposits	10	24	28	47	48
Peso deposits	.....	....	26	34	19
Credit in dollars as % of the total	54.2	59	63	....	....
Credit in dollars to theprivate sector	15.5	27.3	31.7	....	....
Credit in dollars to the public sector	4.0	3.4	4.4	....	....
Average money market rate, pesos (%)	15	8	6.2	6.99	24.9
Average money market rate, dollars (%)	....	....	5.9	6.07	12.76
Average lending rate, pesos	....	10.0	10.5	11.04	28.6
Average lending rate, US$	....	8.0	9.12	9.07	17.5
Country risk premium	....	....	4.9	5.3	43.7

Source: Bonilla and Schamis (2001) and Schuler (2002).

Note: Dollar and peso deposits and credit to the public and private sectors are in billions.

.... Denotes not available.

In order to overcome the effects of the Mexican and the Russian-cum-Brazilian crises, Argentina received substantial financial aid from multilateral organizations. In the former case, the international aid amounted to 7 billion dollars whereas in the latter it shot up to 39.7 billion dollars (the most substantial rescue package after Brazil (August, 1998) and Russia (July, 1999)). While the first financial package was destined to avoid a financial crisis the latter package was provided to avoid an external debt crisis.

However, Argentina's stagnant economy did not allow the country to service its foreign debt payments. As in the very recent past, several attempts were made to restore confidence in the economy and to get the 'growth ball rolling.' These included the re-appointment of the father of the Convertibility Plan, Domingo Cavallo, as Minister of Finance, and the granting of special powers to Cavallo which allowed him to pass budgetary measures and change institutional arrangements without the approval of Congress. Cavallo also attempted to jump-start growth by a set of measures to stimulate investment, tax relief measures, the roll-over of short-term for long-run external debt involving 29 billion dollars and differential exchange rate for exporters and importers.

These measures were ultimately unsuccessful, the country risk soared and Argentina suspended its foreign debt service payments at the end of 2001, signalling the end of the currency board regime.

The Lessons of Two Monetary Experiments

Argentina adopted currency-type board arrangements in the nineteenth and the twentieth centuries under very different historical circumstances and contexts. Both experiences have similarities worth exploring. They shed light on the main issues specific to currency board regimes while providing a basis on which to examine the analytical underpinnings of economic rules.[25]

First, the Conversion Caisse and the Convertibility Plan were put in practice ultimately to mitigate a distributive conflict that put in peril economic stability and growth. The 1899 Caisse sought to eliminate the fluctuations in the gold premium that had led to opposing interests between exporters and importers. The 1990 Plan put an end to an inflationary process that reflected the antagonistic interest of economic and political groups.

Viewed from this perspective, rules suppress the economic manifestation of political and/or social processes. But they do not provide a solution to the ultimate problem nor do they cover all of its possible economic manifestations. As a result, the political and social conflicts appear in another guise. Unemployment, increasing debt, dollarization of assets and the divide between debtors and creditors are some of the well-known alternate forms. This line of analysis implies that an economic rule is not an efficient alternative to, say, a process of inflation, because it simply evades the problem. In fact, it suggests that an economic rule must by logic be accompanied by a political rule. Yet this undermines the very foundations an economic rule is supposed to help guarantee, that is, freedom of choice.

Second, after their implementation both Argentine monetary arrangements wer followed by a short period of 'good' macroeconomic performance. In the case of the Conversion Caisse it lasted from 1910 to 1912-13. In the case of the onvertibility Plan the golden years comprised the period 1990-1994. This period of prosperity is used as the main argument to defend and justify currency boards (Cavallo, 1996; Hanke, 1999; Frankel, 1999).[26]

This performance illustrates that currency boards are indeed perceived by the public as 'regime changes', that is, they are associated with changes in policy that are widely believed. This pertains to national and also foreign agents. The change in national agents' expectations leads to the restoration of confidence in the currency and the abrupt stoppage in inflation. Changes in foreign agents' expectations set the basis for capital inflows. Both sets of expectations obviously feed upon each other: domestic price stability provides credibility for foreign capital flows and these guarantee the expectations that warrant price stability.

---

25 Obviously economic events unfolded, as Taylor (1993) puts it, in chronological time they are irreversible, affected by chance and contingencies that occur only once, and to some extent they are unique.

26 Mishkin (1999, p.19) writes: "Since 1991 Argentina has become a model of price stability and has achieved laudable growth rates, aside from setbacks such as the Mexican Peso Tequila –induced recession in 1995, from which Argentina soon rebounded strongly. By most accounts, the currency board has worked in Argentina."

Maintaining a belief in a 'change of regime' proved crucial to the survival of the currency board.

Third, the benefits produced by market reforms – which accompany the implementation of currency boards, including trade and financial liberalisation, and privatisation – were not shared by all. An illustrative example is the evolution of the ratios between professional and unskilled and professional and skilled workers' wages in Argentina. Available data show that, between 1990 and 1998, both ratios increased from 3 to 5 and from 2 to 3 respectively. The concentration of assets referred to above and the change in the Gini coefficient from .49 to .45 between 1989-1999 point in a similar direction. Moreover, the groups (i.e., existing pensioners) that function outside the market are simply excluded from the whole process of reforms.

Thus overall, policy makers needed to balance the need for a wide-held belief in a regime change with the resulting effects currency board cum stabilisation package which favoured specific interests. But the balance is very hard to strike. The outcome may well be complex political economy interactions involving coalitions and changes of coalitions over time that undermine the very basis for the 'credibility' that sustains the change in regime. An example is provided by the Economist's analysis of President Menem's lobbying for support in 1999: "he has been consolidating his support among provincial governors and trade unions. In return, the President has diluted his ambitious labour reform proposals, much to the annoyance of both business and IMF."

Fourth, the expectations induced by the regime change are not immutable and indeed are liable to changes and reversals. Shifts in expectations are brought about by changes in the external conditions, which in turn affect the 'fundamentals.' Both Argentinean regimes discussed in this paper were subject to unforeseen external shocks that could not be withstood. The shocks produced a reversal in expectations. This is especially clear in the case of the Convertibility Plan.[27]

The Caisse faced the contraction in capital flows that accompanied the belligerent efforts of 1914. Later in 1929, it was faced with a pronounced decline in the terms of trade and a floating debt that could not be serviced. The Convertibility Plan confronted the Mexican crisis, the Asian crisis and the devaluation of the Brazilian Real.

The fact that currency boards function smoothly under favourable external conditions and are liable to break under opposite conditions has made them earn the "fair weather boards" label. Ford (1962, p. 108) puts this issue succinctly in the following words referring to the 1899 Caisse:

> In short, the convertibility of the currency is dependent upon our prosperity and not upon the existence of a Conversion Fund. As occurred earlier in Argentine history, such an exchange bureau had proved a one-way street, **a fair weather scheme**, which functioned only when gold was coming in....But when gold moved out of the country

27 See, for example, Fanelli (2002) and Fenelli and Heymann (2002).

> and the note circulation was being contracted...weak governments in the face of political pressure might hesitate to allow the currency supply to be contracted, accepting inconvertibility by resorting to the printing press to maintain the currency supply in the hope of avoiding numerous failures, and incidentally, bringing a favourable redistribution of income for the land-owning and exporting interests.

More to the point this line of reasoning indicates that the underlying logic of a currency board is that economic events unfold in an ergodic environment, that is, in an environment where "the future is merely the statistical reflection of the past" (Davidson, 1994, p. 90).[28]

Fifth, the monetary authorities were not passive when faced with the external shocks. This highlights the fact that a currency board regime is not equivalent to putting an economy on 'automatic pilot' and that a central monetary authority remains an essential institution.

The nature of the currency board, the fiscal position, and the state of balance sheets of the financial and private sector severely constrained the degree to which the monetary authorities' could pursue an activist policy. These factors also determined the nature of the intervention.

The nature of the currency board implies that fiduciary issues have to be backed by reserves and that there is a limit to which the monetary authorities can run down reserves when faced with an external shock. In addition, the credibility needed to make a currency board function often sets an implicit backing limit above the required currency board limit. Also a decline in central bank assets, i.e., international reserves, is accompanied by a decline in its liabilities, i.e., domestic credit. The overall result is a reduction in the liquidity of the system threatening the viability of the financial system.

An alternative course of action is to increase domestic interest rates. Yet this has negative repercussions on business production decisions output and may lead to a rise in foreign debt increasing the fragility of public and private sector balance sheets. Higher interest rate spreads widen the mismatch between the composition of assets and liabilities and short and long debt positions in foreign and domestic currency. This also rules out any devaluation of the currency.

In both case studies presented the monetary authority opted for three courses of action: (i) the 'restoration' of the lender of last resort function to the central monetary authority; (ii) the provision for a partial exit option; (iii) the abandonment of the currency board. The 1914 monetary law, the use of the Nation Bank's currency in its vaults in 1914 and 1929 to avoid a decline in reserves and the US$5 billion dollar liquidity provided by the Argentinean Central Bank following the Mexican crisis are examples of the first course of action. The dual exchange rate system for exporters and importers and deciding to peg the exchange rate to a basket of currencies (the dollar and the Euro) in 2001 are examples of the second course of action.

---

28 See again Fanelli and Heymann (2002).

In the case of the Caisse, in 1928-1929 the public floating debt frustrated the Bank of the Nation's intent to avoid a downfall in reserves. In the case of the Convertibility Plan, the attempts to ignite the economy by partially changing the exchange rate regime were frustrated by lack of credibility induced by the accumulation of foreign external debt.

Sixth, although the monetary authorities were not purely passive, the main adjustment leverage of a currency board is always fiscal. Authorities control aggregate demand and hence determine the current account position through fiscal means. The fiscal result is also one of the main variables through which the 'fundamentals' are judged by international investors.

Yet a currency board does not guarantee fiscal discipline *per se*. Both case studies presented in this paper attest to this fact, which can be easily found as well in other examples of countries that adopted currency boards in the decade of the 90's. Table 7 shows both the fiscal deficit and foreign debt as a percentage of GDP before the implementation of the currency board, one year after, and the latest available estimate in the 1990's. In most cases the fiscal position deteriorated.

Table 7
Fiscal Deficit and Foreign Debt as Percentage of GDP in the 1990's Currency Board Countries

Country	Fdcb	Fdacb1	FdacbL	Edbcb	Edacb1	EdacbL
Argentina	-7.6	-0.2	-2.0	32.3	27	51
Estonia	4.7	-0.7	-4.8	0.0	....	4
Lithuania	-5.3	-4.5	-7.9	....	14	22
Bulgaria	-12.7	0.9	0.5	....	...	....
Bosnia and Herzegovina	-3.0	-2.0	....	....	....	....

Source: IMF Financial Statistics. Several Issues. Hanke (2000)

Note: Fdbcb = Fiscal deficit as a percentage of GDP before the currency board. Fdacb1 = Fiscal deficit as a percentage of GDP one year after the currency board.FdacbL = Fiscal deficit as a percentage of GDP after the currency board. Latest available estimate in the 1990's.Edbcb = External debt as a percentage of GDP before the currency board.Edacb1 = External debt as a percentage of GDP one year after the currency board.EdacbL = External debt as a percentage of GDP after the currency board. Latest available estimate in the 1990's..... Denotes not available.The dates of currency boards for these countries are:

Argentina, 1991
Estonia, 1992
Lithuania, 1994
Bulgaria, 1997
Bosnia and Herzegovina, 1997

This line of reasoning leads one logically to argue in favour of a fiscal rule as opposed to a monetary rule. The budget constraint of a government in a currency board states that government expenditure and its interest payments on the domestic and foreign debt net of taxes can be financed by an increase in domestic and/or foreign debt.[29] Formally,

$$G + rD + reD^* - T = \Delta D + e\Delta D^* \qquad (1)$$

where

G = government expenditure.
T = tax revenue.
D and D^* = domestic and foreign debt stocks.
r and r^* = domestic and foreign rate of interest.
e = the exchange rate.
ΔD = change over time.

Assuming for the purpose of simplicity that D and ΔD are zero, and following De Grauwe (1994, p. 195), the budget constraint can be expressed as,

$$\Delta(eD^*/Y) = (G/Y - T/Y) + (r^* - y)((eD^*)/Y) \qquad (2)$$

where

Y = output level.
y = rate of growth of output.

Equation(2) states that unless the government has a surplus (i.e., *(G/Y-T/Y)* is greater or equal to 0), the foreign debt to output ratio *(eD*/Y)* will increase as long as the foreign rate of interest is greater than the rate of growth of output *(y)*. Note that the currency board does not place any constraint or limit on the increase in the foreign debt stock. A fiscal rule can be imposed such that $\Delta(eD^*/Y) = 0$. Applying this fiscal rule to Eq.(2), the following equality is obtained,

$$(T/Y - G/Y) = (r^* - y)((eD^*)/Y) \qquad (3)$$

---

29 It is assumed that the Central Bank does not issue high-powered money to finance the government déficit.

Equation (3) states that the fiscal rule proposed implies that if $r^* > y$ then the government will have to obtain a surplus, that is, any external shock that increases r^* or causes a decline in y will have to be met by an increasing tax ratio *(T/Y)* or decreasing government expenditure ratio *(G/Y)*.

A fiscal rule has, however, two important drawbacks. It is as procyclical as a monetary rule and can aggravate rather than mitigate fluctuations. Authorities can respond to a decline in y by decreasing G/Y which in turn causes a contraction in y, leading to further reductions in G/Y. In addition, if the fiscal deficit represents the confluence of political and economic interests there is little chance of making the rule a binding one. The fiscal rule will become a 'soft' rule and putting in place a 'hard rule' leads to the type of contradiction discussed at the beginning of this section.

Seventh and finally, both episodes illustrate that the fiscal deficit and the accumulation of foreign debt were important contributors to the demise of the currency board. But an explanation of currency board crises should also take into account the behaviour of the private sector. In fact, it is the dynamics generated by both the public and private sectors that can provide a full and complete explanation of the downfall of this monetary arrangement.[30]

Let i be the domestic interest rate and i^* the foreign rate of interest. External and internal monetary long-run equilibrium conditions require that:

$$i^* = i + \delta \tag{4}$$

$$\delta = (p_f - p_s)/p_s \tag{5}$$

and

$$i = \varphi + r, \tag{6}$$

where δ is the premium or discount on the currency (p_f is the forward price of the currency and (p_f its spot price); φ is the expected appreciation or depreciation of an asset in money terms and r is the rate of return of the asset measured in terms of itself.

---

30 Taylor and Eatwell (2001, p.176) state: "...financial crises are not made by an alert private sector pouncing upon the public sector's fiscal or moral hazard foolishness. They are better described as private sectors (both domestic and foreign) acting to make high short-term profits when policy and history provide the preconditions and the public sector acquiesces." Part of the explanation that follows is based on Taylor (1998) and Taylor and Eatwell *(op.cit)* but the public sector plays a bigger role which in their view validates mainstream crisis models such as those of Paul Krugman.

Equation 4 is simply the interest rate parity theorem. Its states that "the market is prepared to pay a premium for future delivery of a currency, when the return on deposits in that currency, i.e., the interest rate, is higher than that payable on other currencies" (Rogers, 1989, p.204). The latter equation is the condition for monetary equilibrium and follows from Keynes (1936).[31]

Starting from a condition of full equilibrium a change of regime produces an increase in *j* as confidence is restored in the currency and the state of the economy. This in turn produces an increase in the domestic rate of interest *i*. Initially in a fixed exchange regime when there are no devaluation expectations the future and spot prices coincide, thus the term capturing the premium or discount on the currency $((p_f-p_s)/p_s)$ is equal to 0. This produces an interest rate spread, which reduces the cost of indebtedness in foreign currency relative to borrowing in domestic currency. This induces firms and the government to increase their stock of foreign currency-held debt. As was illustrated in the case of the Convertibility Plan, 63% of bank credit in 1997 was in foreign currency and most of the credit was granted to the private sector.

This situation is sustainable as long as foreign savings net of debt service payments (S^*n) can finance the process of debt accumulation. This follows from financial balance accounting. Accounting identity conventions require that total savings equal total domestic investment plus foreign savings. In the same way, conventions require that the excess of investment over savings of households $(Ih-Sh)$, firms $(If-Sf)$ and the government $(Ig-Sg)$ which are equal to the increase in

---

31 Eq. (4) and (5) follow from Keynes' *Tract on Monetary Reform* (1923). According to Keynes (1923) the forward premium or discount over spot prices reflects the preference of the market for holding funds in one centre relative to another. If the dollar forward is quoted cheaper than the dollar spot to a London buyer this indicates a preference for maintaining liquid funds in New York rather than in London. In turn this preference is determined by the difference in the rates of interest in New York and in London. That is,

$$(4a)\quad i - i^* = (p_f - p_s)/p_s \quad = \quad i = i^* + (p_f - p_s)/p_s$$

According to Rogers (1989) and Kregel (1986) Keynes applied this framework in the *General Theory* (1936) to the determination of "interest rates between different commodities rather than interest rates applied to different financial centres". The rate of interest is the rate of return over over cost and is defined as the difference between future and present value over present value. This applies both to commodities and to assets. The rate of return for a commodity expressed in terms of that commodity equals, (4b) $r = (q_f - q_p)/q_p$. This rate of return can be expressed in money terms as, (4c) $r_m = (p_f q_f - p_p q_p)/p_p q_p$. The condition of equilibrium requires the equality between both rates of interest. However, the equality between a rate of return on a commodity expressed in physical terms and that of money requires adding to the rate of return of a commodity a factor accounting (i.e., a) for the appreciation or depreciation of the commodity in question in money terms.

$$(4d)\quad r_m = r + a$$

Eq. (4d) states the condition for monetary equilibrium taking into account domestic assets and eq.(4a) states the condition for monetary equilibrium taking into account domestic and foreign assets. In full equilibrium both conditions should hold.

their internal and external debt *((ΔDh - ΔMh), ΔDf+ δΔD*f)* and *(ΔDg+δΔD*g)* respectively) be equal to foreign savings. Foreign savings are equal to net exports *(X-M)*, interest rate servicing *(r*eD)* and current and capital transfers (*F* and *Z* respectively).[32] That is,

$$Sh + Sf + Sg = Ih + If + Ig + S^*n \quad (7)$$

$$\begin{aligned} Ih\text{-}Sh &= \Delta Dh - \Delta Mh \\ If\text{-}Sf &= \Delta Df + \delta\Delta D^*f \\ Ig\text{-}Sg &= \Delta Dg + \delta\Delta D^*g \end{aligned} \quad (8)$$

$$(\Delta Dh - \Delta Mh) + (\Delta Df + \delta\Delta D^*f) + (\Delta Dg + \delta\Delta D^*g) = Sn^* \quad (9)$$

$$Sn^* = (X\text{-}M) + F + \delta Z \quad (10)$$

An external shock causing a downward change in the components of equation (10) or a sudden change in the discount of premium (δ) on holding the currency that is not accompanied by change in *Sn** in the same direction generates a situation of financial fragility. When foreign capital flows dry up the alternatives are to boost investment and exports, reduce imports, increase savings or attract more capital.

The path chosen involves reducing imports by aggregate demand contraction in an effort to increase public savings and increasing interest rates to attract foreign capital. The positive effect on the trade balance is generally overpowered by the negative effect of output contraction on aggregate savings (including government savings) which is compounded by the decline in investment plans due to higher rates of interest. This type of response can generate unsustainable debt dynamics. The stage is thus set for the demise and definitive abandonment of the currency board regime.

Conclusion

The paper analysed two monetary experiments in Argentina in two distinctly different historical contexts. Both experiments involved the implementation of monetary rules to eliminate variations in exchange rates and prices. In both cases, following a period of prosperity, the boards were confronted with external shocks that proved to be fatal to their existence. The dynamics which ultimately led to the abandonment of these experiments depended on both public and private sector behaviours.

At a deeper level a comparison of both case studies illustrates the limitations of economic rules. Economic rules are meant to replace authorities in decision

---

32 In the example used for the fiscal rule the term d was not included for expository purposes.

making and to allow agents to express their freedom of choice. As put by Simons (1948, p.160): "The liberal creed demands the organisation of our economic life largely through individual participation in a game with definite rules. It calls upon the state to provide a stable framework of rule within which enterprise and competition may effectively control and direct the production and distribution of goods." One such rule is a monetary rule. Monetary rules are defended on the grounds that they reduce uncertainty (Friedman, 1960). The monetary rule must also determine fiscal policy (Simons, *op. cit.* p.79).

However, as shown in the cases presented in the paper, rules can be a source of economic instability. Rules do not replace authorities but are rather set up as substitutes for institutions. In addition, because rules function in an ergodic environment and possess the credibility and authority of an institution, which is reinforced by the public perception with respect to changes in regime, they convey to private investors the atmosphere that indeed the future will be like the past. This validates their practical behaviour as "perfect Benthamite maximisers," which jointly with public sector profligacy (which is in fact not constrained by currency board arrangements) leads to unstable dynamics.

References

Baer, W., P. Elosegui, and A. Gallo. 2002. *The Achievements and failures of Argentina's Neo-Liberal Economic Policies.* Mimeo. University of Illinois.

Bonilla, E.D and H.E. Schamis. 2001. *From Redistribution to Stability: The Evolution of Exchange Rate Policies in Argentina*, 1950-1998 in Jeffry Frieden and Ernestos Stein. The Currency Game (Washington D.C.: Inter-American Development Bank), pp. 65-118.

Bordo, M. 1984. *The Gold Standard: The Traditional Approach* in M. Bordo and A. Schwartz Eds. *A Retrospective on the Classical Gold Standard, 1821-1931.* Chicago: The University of Chicago Press.

Bordo, M. and C.A. Végh. 1998. *What if Alexander Hamilton Had been Argentinean? A comparison of the early monetary experiences of Argentina and the United States.* NBER Working Paper Series. Working Paper 6862.

Brunner, K. and A. Meltzer. 1997. *Money and the Economy: Issues in Monetary Analysis.* Cambridge: Cambridge University Press.

Cavallo, D. 1996. *Lessons from the Stabilization Process in Argentina.* In Achieving Price Stability. A Symposium Sponsored by the Federal Reserve Bank of Kansas City. Kansas City: Federal Reserve Bank of Kansas.

Davidson, P. 1994. *Post Keynesian MacroeconomicTheory.* Brookfiled: Edward Elgar.

De Grauwe, P. 1994. *The Economics of Monetary Integration.* New York: Oxford University Press.

Diaz Fuentes, D. 1998. *Latin America during the Interwar Period: The Rise and Fall of the Gold Standard in Argentina, Brazil and Mexico.* In John H. Coatsworth and Alan M. Taylor Eds. *Latin America and the World Economy Since 1800.* Cambridge: Harvard University Press. pp.443-470

Eatwell, J. and L. Taylor. 2000. *Global Finance at Risk.* New York: The New Press.

ECLAC. 2001. Preliminary Overview of the Economies of Latin America and the Caribbean. LC/G.2153-P. Santiago de Chile: Chile.

Eichengreen, B. 1996. *Globalizing Capital.* New Jersey: Princeton University Press.

Fanelli, J. M. 2002. "Crecimiento, inestabilidad y crisis de la convertibilidad en Argentina." *Revista de la CEPAL,* 77, pp.25-45.

Fanelli, J.M. & D. Heyman. 2002. Monetary dilemmas: Argentina in Mercosur. *ECLAC. Series Studies and Perspectives,* No.7. ECLAC. Buenos Aires.

Ford, A.G. 1962. *The Gold Standard 1880-1914. Britain and Argentina.* New York: Oxford University Press.

Frankel, J.A. 1999. *No Single Currency Regime is Right for all Countries or at all Times.* NBER. Working Paper 7338.

Friedman, M. 1953. *Essays in Positive Economics.* Chicago: The University of Chicago Press.

Friedman, M. 1960. *A Program for Monetary Stability.* New York: Fordham University Press.

Hanke, S.H. *The Disregard for Currency Board Realities.* Cato Journal, Vol.20, No.1. (Spring/Summer 2000). Pp.49-59.

Keynes, J.M. 1964. *The General Theory of Employment, Interest and Money.* New York: Harcourt Brace Jovanovitch Publishers.

Keynes, J.M. 1923. A Tract of Monetary Reform.

Kregel, J. 2003. "An Alternative View of the Argentine Crisis: Structural Flaws in Structural Adjustment Policy". *Investigación Económica.* January-March, 243, pp.15-49.

Mishkin, F.S. and M. A. Savastano. 2000. *Monetary Policy Strategy for Latin America.* NBER. Working Paper 7617.

Nakamura, L. and C.M. Zaragaza. 2001. *Banking and Finance in Argentina in the Period 1900-35.* Federal Reserve Bank of Dallas. Working Paper No.01-7.

_____. 1998. Economic Growth in Argentina in the Period 1900-1930: Some Evidence from Stock Returns. In John H. Coatsworth and Alan M. Taylor Eds. *Latin America and the World Economy Since 1800.* Cambridge: Harvard University Press. pp.247-267.

O'Connell, A. 1984. *Argentina into the Depression: Problems of an Open Economy* in Rosemary Thorp Ed. *Latin America in the 1930's.* London: MacMillan Press.

Paolera della, G. and A.M. Taylor. 2001. *Straining at the Anchor.* Chicago: University of Chicago Press.

_____. 1998. *Finance and Development in an Emerging Market: Argentina in the Interwar Period.* In John H. Coatsworth and Alan M. Taylor Eds. *Latin America and the World Economy Since 1800.* Cambridge: Harvard University Press. pp. 139-169.

Peters, E.H. 1934. *The Foreign Debt of the Argentine Republic.* Baltimore: The Johns Hopkins Press.

Rogers, C. 1989. *Money, Interest and Capital.* New York: Cambridge University Press.

Rosa, J.M. 1909. *La Reforma Monetaria en la República Argentina.* Buenos Aires: Imprenta y Casa Editora de Coni Hermanos.

Sargent Th.J. 1982. *The Ends of Four Big Inflations.* In Robert Hall Ed. *Inflation: Causes and Effects.* Chicago: University of Chicago Press. Pp. 41-97.

Simons H.C. 1948. *Economic Policy for a Free Society.* Chicago: University of Chicago Press.

Taylor, L. 1998. *Capital Market Crises: Liberalisation, Fixed Exchange Rates and Market-Driven Destabilisation.* Cambridge Journal of Economics, 22, 663-676.

_____. 1993. *Income Distribution, Inflation and Growth.* Cambridge: MIT Press.

Warburton, C. 1964. *Depression, Inflation and Monetary Policy.* Selected Papers. Baltimore: Johns Hopkins Press.

Williams, J. H. 1920. *Argentina International Trade Under Inconvertible Paper Money* 1880-1900. New York: Greenwood Press Publishers.

Wynia, G. W. 1992. *Argentina.* New York: Holmes and Meier.

13

Predictors of Currency Crises in Fixed Exchange Rate Regimes: Lessons for the Caribbean from the Case of Argentina

Marion Williams

Abstract

The paper first discusses the difference in macroeconomic responses to exchange rate adjustment in developing countries compared with European countries. It defines a currency crisis and questions whether speculation causes or merely intensifies a currency crisis. The paper analyzes the similarities and differences between Argentina and those Caribbean countries with fixed exchange rates. In particular, it also tries to identify those factors which appear to be more important indicators of impending crises in fixed exchange rate regimes such as inadequate foreign exchange reserves, overvalued exchange rate, persistent current account deficits, high levels of foreign debt, large fiscal deficits, high interest rates, limited capital flows and sovereign debt default, and suggests how some of these may be avoided. It also notes that factors such as contagion and proximity may be unavoidable dangers. The paper concludes by identifying the lessons for the Caribbean which might be learnt from the Argentina experience.

SECTION 1

Introduction

In treating with currency crises over the past four decades, it had become popular for the international financial institutions to suggest devaluations as a prescription for every economic crisis. The implication was that the currency value was inappropriate. The case of Latin America is

replete with examples and this presumption became standard in International Monetary Fund programmes for over thirty years. As some countries floated their currencies, it was recognised that floating took tremendous pressure off authorities to make continuous monetary and fiscal policy adjustments, and an increasing number of countries, particularly developed countries, chose that option. As a greater number of countries floated, the exchange rate became less of an issue in macro-economic management programmes, and in fact, in developed countries became almost unimportant.

Developing countries too were encouraged to float their exchange rates. It was argued that this was the easiest route to opening up their economies and permitting financial liberalisation to propel economic growth. While this formula worked for developed countries, the road was more rocky for developing countries. Indeed, the responses of developed and developing countries to the floating of the exchange rate proved to be very different.

Ricardo Hausmann *et. al.* (1999) argue that the European experience suggests that letting the exchange rate float

- allows for lower interest rates
- has little effect on the price level, and
- allows output to recover

while in the Latin American case it

- leads to an increase in interest rates
- has a large inflationary effect; and
- causes a major decline in output.

He noted that the recommendation that developing countries float their exchange rates often led to major currency depreciations and to increasing levels of volatility.

A few countries dared to be different. Fixed exchange rate systems and Currency Board systems continued to be used successfully by a number of other developing countries. Several Caribbean countries were among them - Barbados, Bahamas, Belize, the East Caribbean States - and there were also a number of other countries outside the region. The first three had fixed exchange rates and the others implemented both a fixed exchange rate and a Currency Board system. Argentina was the only Latin American country which chose a fixed exchange rate regime and a Currency Board system and it became the country which the world watched.

After a history of 8 major stabilisation programmes in 40 years, most of them based on a fixed exchange rate or a pre-announced exchange rate depreciation, Argentina put in place a convertibility plan in 1991. The country's experience with several currency crises encouraged the Argentina Government to conclude that stability could return if the exchange rate was pegged. The choice of a Currency Board system was a further safeguard. This programme linked the peso to the U.S. dollar at the rate of US$1 to 1 peso and guaranteed convertibility to U.S. dollars; the domestic currency base was fully backed by the foreign exchange reserves of the Central Bank. From April 1991 the convertibility law and the reliability of the exchange rate determined the stability of the Argentine

economy. The reform helped to control hyperinflation immediately and the programme assisted the country in emerging from a series of crises and led to eleven years of relative stability.

In the first 8 years following the programme, the economy became more open, exchange controls were removed, a major privatisation programme was launched, business productivity rose and the country's export base was diversified.

Argentina's fixed exchange rate regime was held up by the IMF as an example of the success of a currency peg in bringing about stability. It was argued that it was this peg which allowed the country to withstand the strain of the tequila crisis in 1995, the South East Asian crisis and the Russian currency crisis. However, weakened by the contagion from the 1995 crisis, the devaluation by Brazil in 1999 put severe pressure on the Argentine economy, and the external account deteriorated despite several IMF programmes.

In January 2002 Argentina was forced to devalue its currency. This followed consistent and substantial capital flight, and several unsuccessful measures to lock down the banking system. The currency was devalued in the first instance by 29% and after trying unsuccessfully to defend the rate, the currency was allowed to float. At the end of October 2002 one U.S. dollar was equivalent to 3.525 pesos. There is a school of thought that the crisis in Argentina took root because Argentina held on to fixed exchange rates for too long.

Following the currency crises of the mid-1990s, the burning question begun to surface again as to whether currency crises could be predicted, whether these difficulties were avoidable and whether they were caused by the fixed exchange rate peg. This paper analyses the Argentine crisis with a view to identifying lessons for the Caribbean. Section 2 deals with the issue of defining a currency crisis. Section 3 identifies predisposing factors and shows how they might lead to currency crises. Section 4 discusses the extent to which these factors were evident in Argentina and Section 5 discusses which indicators are more critical for fixed exchange rate economies. Section 6 discusses the similarities and differences between Argentina and those Caribbean countries with fixed exchange rates, and the paper concludes with a discussion of the lessons to be learned from the Argentina situation.

SECTION 2

Definition of a Crisis

The definition of currency crises has been the subject of some debate but generally a crisis can be defined as a very significant depreciation in the currency (Frankel and Rose, 1995). Others have defined a currency crisis as a situation in which a country's currency is depreciated and/or its international reserves are seriously depleted (Eichengreen, Rose and Wyplosz, 1996). The second definition is probably more generally accepted and is the one which will be used here. Some researchers seek to quantify the definition. One suggests that a depreciation must be in excess of 25%, and there must also be a 10% increase in the rate of depreciation before a currency can be considered to be in crisis (Frankel

and Rose 1996). However, this is probably bringing too high a level of specificity to a problem that is really about confidence. Irrespective of which definition one uses it is generally agreed that currency crises are usually accelerated, though not necessarily caused by, speculation against the target currency, and are usually accompanied by a view among speculators that the currency will be devalued anyway and that speculators should reduce their losses or maximise their profits while they can. It is often thought, however, that while speculators can precipitate the crisis there are always factors already there which point to a devaluation of the currency, and that speculators only advance the date of exhaustion of foreign exchange reserves.

Currency Values and Confidence

A determination of whether a crisis is imminent must be taken against the background of the country's history of financial stability. A depreciation of a particular size in one country may not spark a crisis, while a less significant currency depreciation in another might. One can therefore say fairly definitely that where a country has a history of currency crises any significant depreciation in the currency is likely to lead to expectations of another currency crisis. In a country like Argentina which had such a long history of currency crises, any significant depreciation would have sparked a crisis. For this reason, a fixed exchange rate peg was an excellent opportunity for the country to get itself out of the syndrome of constant devaluations. Many developing countries in the Caribbean and elsewhere continued to use such regimes and this was transplanted to many of the post-USSR regimes where political, social and economic turmoil required the stability of a currency peg.

Many of the factors to be monitored by fixed exchange rate economies, if they are to avoid currency crises, are basically no different from those which floating rate economies must be concerned with if they are to ensure stable economies. In the case of fixed exchange rate economies, these factors are more critical since the adjustment is not in the exchange rate but in the level of reserve foreign exchange adequacy. While few of these predictors, on their own, can precipitate a crisis, together they indicate an impending crisis.

SECTION 3

Predictors of Currency Crises

It is critical to identify the warning signals. This section identifies such signals, and then discusses each one.

The main predictors of currency crises are identified here as:

1. Inadequacy of foreign exchange reserves
2. Problems of purchasing power parity/overvalued exchange rate

3. Large and persistent current account deficits
4. High levels of foreign debt
5. Large fiscal deficits
6. Low debt service capacity
7. High interest rates
8. Drying-up of foreign capital inflows; and
9. Sovereign debt default

Other factors which may predispose a country to crisis are:

(a) Uncertainty about the currency
(b) Political instability
(c) Low or negative rates of growth of GDP
(d) Weakness of the financial system
(e) Speculative attacks; and
(f) Herding

Warning Signals

1. Inadequacy of Foreign Exchange Reserves

One of the surest signs of an impending crises is inadequate reserves. Falling foreign exchange liquidity results in the inability to meet external debt obligations and to make payments for necessary imports of goods and services. Each country should set a threshold below which it is not prepared to allow foreign exchange holdings to decline. Holdings below this threshold would signal that there is a balance of payments problem.

2. Overvalued Exchange Rate

An overvalued exchange rate makes exports expensive and imports cheaper, thus reducing the rate at which a country can accumulate foreign exchange reserves and increasing outflows for the financing of external goods and services. While this cannot cause a currency crisis directly, it constrains the rate of foreign exchange accumulation, and slows the rate of economic growth – factors that are very important for creating sound economic fundamentals.

3. Current Account Deficits

In the pre-1990s it was generally believed that most currency crises were a result of large and persistent current account deficits. However, recent empirical studies have been unable to definitively conclude that large current account deficits caused currency crises, though there was some admission that large current account deficits raise the probability of a crisis, broadly defined.

Edwards (2000) concluded that, in spite of recent claims of the irrelevancy of current account deficits, the evidence provides support for the view that large deficits should nevertheless be a cause for concern. However, he was careful to point out that it does not imply that a large current account deficit is a necessary condition for a currency crisis to exist.

Very often the issue hangs on sustainability of the deficit. Some theorists argue that a country can run a current account deficit for a limited period, but no deficit is sustainable indefinitely. A distinction is often made between a deficit which results from fiscal imbalances and one which results from investment. The latter, it is argued, should not be a matter of concern at all as it is important to focus not only on the persistence of the current account deficit, but also on whether it is leading to higher investments. This view is held also by Sachs et al (1996) who argued that policy actions that result in higher investment opportunities will necessarily generate deterioration in the country's current account, but that this is not problematic.

4. High Levels of Foreign Debt

Similarly, it is argued that rapid increases in developing countries' foreign debt are not necessarily a sign of increased vulnerability as long as they, too, create greater investment opportunities. A more critical warning signal is the maturity of the debt, as has been shown by the experience of South East Asia. High levels of short-term debt can lead to greater levels of volatility than high levels of long-term debt, particularly where money markets are very developed.

5. Large Fiscal Deficits

Where large fiscal deficits are financed by printing of money, fiscal policy tends to be expansionary and if the country is not engaged in predominantly domestically produced goods, this leads to higher levels of imports, to larger outflows of foreign exchange and to lower foreign exchange reserves. Attempts to increase taxes to meet these expenditures can reduce surpluses available for investment and lead ultimately to a contraction in the economy. Expenditure control is therefore usually advocated.

6. Debt-Service Capability

The size of the debt itself is probably less important than the ability to service it, i.e., the debt-service ratio. Where the debt is large and interest rates are low, the same size debt can be more sustainable than in a high interest rate regime. Invariably, however, foreign borrowing tends to be at floating rates and the margins on emerging market debt widen at precisely the time when countries can least afford high interest rates. The size of domestic debt, though not as critical as that of foreign debt, can also be burdensome where interest rates are high. Where there is lack of confidence in the economy, authorities are forced to compensate investors in order to pre-empt capital flight. A country with current high debt-service ratios signals to potential investors that the debt could become unsustainable.

7. High Interest Rates

High interest rates, whether domestic or inter-national, make borrowing expensive and make a reasonable return on productive investment difficult, so that potential investors then switch to buying government securities, thus distorting the investment choices of individuals and delaying economic recovery. It also cripples a government's ability to discharge its other obligations.

8. Drying up of Foreign Capital Inflows

The reluctance of investors to invest in an economy is usually a sign that problems have reached crisis proportions. Where investors decide to divest themselves of a country's securities, high interest rates can sometimes fail to discourage them from doing so if they feel that the offered returns cannot adequately com-pensate them for likely risks. Very often an accom-panying feature is sales of foreign debt at deep discounts. The deterioration becomes rapid, as the discounts become a sign of lack of confidence in the currency.

9. Sovereign Debt Default

Sovereign debt default is usually a proximate cause of any currency crisis but is usually a culmination of increasing difficulties with debt repayment. This is not a predictor. The economy is in crisis.

Other Contributing Factors

(a) Uncertainty about the Currency Peg

Uncertainty about the commitment to the currency peg can also lead to a currency crisis. This can be unrelated to the valuation of the currency. Where the market feels that a currency adjustment or a change in the currency peg is about to occur, this can lead to uncertainties and to speculation against the currency.

(b) Political Instability

While political instability does not necessarily cause a currency crisis, it can contribute to a crisis, particularly where it coincides with an already existing lack of confidence in the currency. This is illustrated in the case of Brazil, where the currency was under severe pressure prior to the election of President Lula. Uncertainty about the election outcome caused increased volatility and led to further depreciation of the currency.

(c) Low or Negative Rates of Growth of GDP

Low or negative growth rates, if sustained over a long period of time, can also contribute to economic crises. This is particularly so where the debt burden is excessive or where interest rates are high and the country cannot

extricate itself from its difficulties. In these circumstances, where the exchange rate is floating, consistent depreciations can ensue. Where the exchange rate is fixed, a foreign exchange crisis can result.

(d) Weakness of the Financial System

A currency crisis can also result from a poorly regulated financial system, which is integrated with the international economy, if this leads to a lack of confidence in the system. This was the case in one South East Asian country in 1997 where regulators permitted significant off-balance-sheet liabilities without appropriate capital provisioning. This led to the collapse of several banks and aggravated the currency crisis.

In the case of Japan, under-providing for corporate debt has been a continuing problem which has contributed to the weakness of the banking system, to the downgrading of Japanese debt and to depreciation of the currency.

(e) Speculative Atacks

In the early literature on currency crises, e.g., (Krugman (1979)), it was usually argued that speculative attacks arose because the target government was engaged in the uncontrollable issue of currency to finance budget deficits, and that the central bank was intent on holding the exchange rate fixed by selling foreign exchange reserves at the target rate. It was also generally believed that such crises arose because of inconsistencies between domestic and exchange rate policies. In this pre-1993 period theorists agreed that currencies were attacked because there were some underlying inconsistencies in the nation's policies, and that investors were merely safeguarding themselves.

From 1993, speculative attacks became more deliberate as the psychology of the market changed. Such attacks were a factor observed with greater frequency in explaining currency crises, possibly because in developed markets, and in the new industrialised countries, significant gains are possible. In 1992, the pound sterling was forced to exit the exchange rate mechanism of the European monetary system because of speculation against it. Gains by speculators were tremendous. Since then the view has increasingly been held that currency crises can also occur because of the manipulation by large agents in countries whose currencies would otherwise have been sound had there been no speculative attack. However, this is less likely to be the case in small developing countries since the gains to speculators are not likely to be significant.

Second generation crisis models, represented by Obstfeld (1994), attempted to seek answers as to why Governments might choose to defend a fixed exchange rate. It was argued that defence of an exchange rate was a matter of trade-offs and not simply a blind matter of defence at any cost.

One answer was that a stable exchange rate was important in encouraging international trade and investment. A second was that the country might have had a history of inflation and believed that a fixed exchange rate was a means of guarding against a recurrence, and a third was that the exchange rate might have become a symbol of national pride. In the case of small countries, even where there is no history of inflation, it is generally believed that a fixed exchange

rate can help to encourage international trade and investment and can bring predictability to international financial transactions.

(f) Herding

The tendency to follow the herd instinct is not usually considered to be speculative but a special form of self-protection. It has been further suggested that fund managers tend to follow the leader, because the cost of being wrong while in a minority is less acceptable than the cost of being wrong while in a majority. This herd behaviour aggravates the demise of the currency. However, it is also argued that there has to be some reason for the underlying loss of confidence for such herding to take place. Hence one is back to the indicators, since herding is unlikely to occur against a currency if the indications of pending crisis do not exist.

Indeed, if investors believe that the cost to the country of maintaining the exchange rate is growing faster than the odds that it will be able to hold off devaluation, they will want to get out of that currency ahead of devaluation, even in the absence of a speculative attack, just in the interest of self-preservation. But in so doing, they worsen the country's ability to hold off the devaluation. Essentially, the argument is made that a currency crisis arises because of the inconsistency of economic policies, irrespective of the exchange rate regime, and that financial markets merely accelerate the event.

Third Country Considerations

Third generation currency crisis models also include among the factors which explain currency crises a number of considerations relating to third countries and which have nothing to do with the economic fundamentals discussed earlier or indeed with the policies of the country. These refer to contagion, proximity and the impact of regional groupings.

(i) Contagion

Contagion can occur where there are international trade and financial associations or exposure to the country whose currency is under pressure. It also occurred between Russia and Brazil at the time of the Russian crisis, despite their distance from each other. Contagion also led to the South East Asian crisis affecting Japan and even the U.S., through exposure of U.S. banks to South East Asia. In an era of financial liberalisation, contagion need not be limited to countries which are part of the same geographical grouping.

(ii) Proximity

However, a country experiencing currency crisis can impact on its neighbours. This was the case in South East Asia between Malaysia, Korea and Thailand. Proximity does not always have an adverse impact, however. If the economy is strong it may ride out the problems – as did Singapore, despite its proximity to other countries in South East Asia.

(iii) Regional Groupings

Being part of a regional grouping can also impact negatively on one country if a member of the group is experiencing difficulties. This was so in the MERCOSUR arrangement when Argentina started to encounter problems which impacted adversely on Brazil and on Uruguay, and it occurred in relation to Mexico and its neighbours in 1994, giving rise to the term "tequila crisis".

Social and Political Contributors to Currency Crises

Factors which are increasingly being included as predictors of financial crises include widespread corruption and cronyism. More recently it has been agreed that social factors and poorly functioning rule of law can also precipitate currency crises. These theories arose out of the South East Asian experience when it was felt that corruption, cronyism and an ineffective rule of law had contributed to the crisis there. These factors however, usually aggravate a crisis but rarely cause it. They were not new aspects in the South East Asia system which occurred during or just prior to the crisis, and the system, though imperfect, had functioned effectively in that environment previously.

SECTION 4

Analysis: How these Indicators Applied to Argentina

In the analysis that follows, these indicators of impending crisis are applied to Argentina with a view to analyzing whether the currency crisis of 2001 – 2002 could have been predicted and therefore could possibly have been avoided.

(i) Argentina: Purchasing Power Parity. Was the Currency Overvalued?

Because of the fixed parity to the dollar, Argentina was unable to respond to the appreciation of its currency. Hence, Federal Reserve interest rate hikes in 1999 and 2000, and a steady appreciation of the dollar impacted Argentina negatively.

Analysts have shown that the Argentine Peso was heavily overvalued (Barclays Capital, 2001). Other evidence was in the lack of competitiveness of the manufacturing sector, the lack of growth of the beef industry in a country which at one time met a major portion of the world's beef demand, contrasting sharply with the growth and competitiveness of Brazil, another MERCOSUR country.

Mussa (2002) notes that "If the U.S. dollar had not been so strong in recent years, Argentina would have had a more competitive exchange rate *vis-à-vis* important European trading partners, contributing both to somewhat better growth and a better balance of payments." Relative to its major trading partner its currency placed it at a disadvantage in the post-1999 period.

(ii) Argentina: Deficits on the Current Account of the Balance of Payments

Though Argentina recorded trade surpluses, the current account of the balance of payments was often in deficit (See Table 1 in the Appendix). For example, there was a positive trade balance in 1999 due to rising world prices for a number of commodity exports and a dip in imports, the current account was still in deficit. This in itself might not have been a problem, but much of the capital inflows was by way of loans.

Despite major efforts, the current account of the balance of payments remained in deficit and by end-2000 was projected to be around 3.1% of GDP, principally as a result of high interest payments.

(iii) Argentina: High Levels of Foreign debt

Between 1991 and 1999 Argentina's external indebtedness rose two and a half times, to reach US$ 144.6 billion. The debt-GDP ratio rose from 28.4% to 51% (IDB 2001). It is frequently pointed out that Argentina's debt to GDP ratio compares favourably with an average of 50% in several European countries (Mussa 2002). The issue, as he notes, was not the debt to GDP ratio itself but the prospects of it not being brought under control, given the high debt-service obligations.

Mussa argues that failure to run a sufficiently prudent fiscal policy that effectively restrained the increases in public debt while the economy was performing well contributed to the later collapse of Argentine reforms.

Estimates by the IDB (2001) indicate that at the end of 2000 approximately 80% of the debt was medium or long term. It is noteworthy that the majority of the debt was therefore not volatile short-term debt. While the composition of the debt showed a well-structured portfolio, the problem was the high debt-service ratio relative to exports of goods and services.

(iv) Argentina: Large Fiscal Deficits

Declining tax revenues and increasing expenditures drove the fiscal deficit up sharply in 1999 to close to double the level of the year before. At end-1999, the deficit of the consolidated public sector represented 4.1% of GDP (IDB 2001). (See Table 2 in the Appendix). The administration engaged in aggressive fiscal policies, cutting expenditures and collecting income tax payments in advance and engaging in debt for bond swaps. These were one-time gains but nominal revenues remained sluggish.

In 2000, Argentina took a bold step, similar to that taken by Barbados in 1991, to cut public service salaries, stepped up its tax collection efforts and passed legislation to control spending in the provinces, but by that time it was too late.

(v) Argentina: Debt Service Capacity

With little prospect of generating a substantial fiscal surplus that would pay off its debts as they matured, the Argentine government faced a large and continuing need to borrow to finance amortisations. In 2000 the external public debt service as a ratio of exports of goods and services was 79.6%. This information did not make for a receptive market and default became inevitable.

(vi) Argentina: High Interest Rates

Towards 2000, high interest rates also made the cost of raising debt quite costly, a development which was a certain indication of impending crisis in Argentina. In the international capital markets in the late 2000, interest rate spreads on Argentine sovereign debt had risen to about 750 basis points above U.S. Treasuries. This pointed to concerns in financial markets about debt sustainability.

(vii) Argentina: Drying up of Foreign Capital Flows

During the early 1990s, Argentina had been a preferred creditor in the financial markets. Except for a short period in 1999 after the problems of the Brazilian Real, the capital markets had been constantly open to it since 1991. By late 2000, Argentina was the largest emerging market borrower, controlling 20% of its asset class. Less than a year later, Argentina was shut out of the markets, an example of how quickly fortunes in these markets can be reversed.

(viii) Argentina: Sovereign Default

Sovereign default closes the creditor out of the markets after several years and is preceded by years of negotiation, write downs, debt forgiveness, rescheduling, haircuts and several other accommodations. The result is a loss of confidence by the market which can take years to rebuild. By the time the country has reached this point, this is not an indicator of impending crisis. It is in crisis.

(ix) Argentina: Other Contributors

Contagion was a problem for Argentina, given the problems of its neighbour Brazil in 1999. Special arrangements with Brazil through MERCOSUR made it especially vulnerable to a currency crisis in Brazil, since it was part of the geographical grouping.

Social and political factors such as the growing gap between rich and poor and rising unemployment have been cited as additional areas of concern. However, these were not the cause of the crisis, but made it less amenable to an easy solution. Restraint in spending which would have helped the macroeconomic situation was, in that situation, socially unacceptable.

SECTION 5

Fixed Exchange Rate Countries - Special Importance of Some Indicators

1. Uncertainty about the Peg

For fixed exchange rate countries it is important that there be complete confidence in the exchange rate peg and in the durability of the exchange rate over the long term. Any expectation of a change in the currency peg has the potential to lead to capital flight, speculation against the currency or, at the minimum, avoidance of the currency for international transactions. In 1999, it is argued, discussions by Argentina's officials about possible dollarisation and later proposals to link the peso to the euro caused uncertainty among investors and contributed to capital flight.

It has been also argued (Mussa 2002) that there was no appropriate exit strategy from the fixed exchange rate regimes. However, Krugman in an article (1996) has noted that invariably, for developing countries, a shift from a fixed to a floating rate leads to massive devaluation of the currency even where statistics do not suggest any overvaluation of the currency. This suggests that a shift in the regime would have been very costly for Argentina.

2. Fixed Exchange Rate Countries and Debt Service Capability

When countries with floating exchange rates are unable to service their foreign debt and must borrow to do so, this generally leads to massive depreciations of the currency. In the case of fixed exchange rate regimes, it can lead to capital flight, foreign exchange shortages and collapse of the exchange rate peg. Floating exchange rate regimes – provided they do not default – may be able to recover from currency depreciations associated with rescheduling and other accommodations. Fixed exchange rate regimes have much fewer options.

3. Fixed Exchange Rate Regimes and High Levels of Short-term Foreign Debt

Sustainability is influenced by the market's perception of the country's ability to service the debt, the country's history of debt management and, to some extent, the fiscal capacity to raise sufficient revenues to service the debt. Where debt levels are inordinately high, particularly where much of the debt is short-term, currency crises can be precipitated.

This is more especially the case for fixed exchange regimes where the tools of monetary policy are more limited. It is therefore even more essential for fixed exchange rate regimes to avoid situations of high levels of short-term foreign debt, and to take action early to repay maturing long-term debt.

4. Fixed Exchange Rate Regimes and Large Fiscal Deficits

Large fiscal deficits financed by money creation lead to high levels of inflation, and in countries which have a high propensity to import, to a drawdown of foreign exchange reserves. For fixed exchange rate regimes, this can involve foreign exchange shortages and the development of unofficial markets and underground economies as well as the end of the fixed exchange rate regime. The avoidance of large fiscal deficits, though important for all exchange rate regimes, is therefore critical for fixed exchange rate regimes.

5. Foreign Exchange Adequacy

The adequacy of foreign exchange reserves is the single most important prerequisite for the maintenance of fixed exchange rate regimes. Unlike floating rate regimes which have the advantage of benefiting from the recourse to depreciation of the currency, fixed exchange rate regimes have none.

6. Capital Controls

It has been argued by Krugman (1996) that countries which peg their currencies to the U.S. dollar must adapt the monetary policies of the country to which they peg. While it is true to say that the scope for having a monetary policy which is different from that of the U.S. is difficult, it is not altogether accurate to say that monetary policy must mimic that of the U.S. or the country to which the currency is pegged.

Where there are no capital controls this may well be true. However, where capital controls exist there is some scope for having a monetary policy which differs from that of the U.S., provided the differential between local and foreign interest rates is sufficiently wide in favour of the domestic country to discourage capital flight. Experience tends to determine this margin but it is influenced by the changing global economic outlook and by investor expectations.

SECTION 6

Similarities and Differences between Argentina and the Caribbean

In the Caribbean, there are several fixed exchange rate regimes: Barbados, Bahamas, Belize and the East Caribbean States. However, there are several differ-ences between the case of Argentina and those fixed exchange rate regimes in the Caribbean.

Firstly, fixed exchange rate regimes in the Caribbean do not have the history of currency crises which Argentina has exhibited over the past 40 years. Fixed exchange regimes in the Caribbean have for the most part stuck to the chosen exchange rate peg and this has led to a tremendous amount of stability in the region. This obtains for both currency board systems and for central banks which from time to time provide funding for government. Also, to date, the Caribbean has been largely insulated from much of the contagion which affects Latin

American countries when their neighbours experience exchange rate difficulties. It is suggested that the risks of contagion are reduced when the neighbour's exchange rates are fixed. What is most affected is access to capital markets during periods of instability in a neighbouring economy. This was the effect of Jamaica's difficulties for the Caribbean region in the1980s. Hausmann *et. al.*, (1999), using the EMBI index, demonstrate much more severe effects from one Latin American neighbour to another. In Latin America (as in the Caribbean) he confirmed that interest rates moved the least in countries with no exchange rate flexibility (Hausmann *et. al.*, 1999, p.7).

While the current account of the balance of payments may be in deficit in some Caribbean countries, for the most part the Caribbean experience suggests that there are significant capital inflows used for real investment, leading to a capital and financial surplus in the balance of payments (See Table 6). In these circumstances a current account deficit can occur without portending a crisis. Current account deficits, though important, therefore tend not to be indicators of impending crises, unless they are exceptionally large and persistent.

With a few exceptions, there has been fiscal discipline in most Caribbean countries. For example, in Barbados over the past 10 years the fiscal deficit has been under 2.5% of GDP with the exception of 2001 (see Tables 3 and 4 in the Appendix). Belize was an exception in 2000 and 2001 (see Table 5 in the Appendix).

In the Caribbean there is an absence of volatility from short-term capital flows, principally because the capital markets are not very developed, so that capital tends to be long term. In addition, in all the fixed exchange rate regimes in the region there is still some measure of capital controls in place and regulatory practices tend to discourage "hot" money.

To date, there have been no significant defaults in Barbados, the Bahamas or Belize - and until recently, OECS countries had not issued borrowings on the international market. There is no uncertainty about currency values and Caribbean countries with fixed exchange rates have never seriously entertained the notion of dollarisation. In addition, there is no widespread holding of US dollar assets in fixed exchange rate regimes in the Caribbean. This is a major difference between Latin America, where dollar assets are routinely held, and Caribbean fixed exchange rate countries. Individuals freely hold domestic assets without demanding a higher interest rate. However, interest rates tend to be somewhat higher in floating-rate Caribbean countries and dollar holdings by individuals are greater. The proposition put forward by Hausmann *et. al.*, (1999) that fixed exchange rate regimes have lower real interest rates in Latin America also appears to be the case in the Caribbean, but low interest rates do not, however, appear to have any relevance as a predictor of the financial health of the economy (note the case of Japan in the 1990s) though the reverse usually portends difficulties.

Most importantly, for most countries, the fixed exchange rate is a matter of national pride and citizens are prepared to engage in other painful adjustments in order to maintain the exchange rate. This was the experience of Barbados in 1991 – 92 when government workers agreed to a wage cut and the private sector to a wage freeze. Though difficult in any circumstances, this is more likely to be achievable in fixed exchange rate systems where nominal wages do not react as

swiftly as in flexible exchange regimes where real shocks are transmitted more quickly through the exchange rate.

Other contributors to crises, such as the risk of contagion arising from being part of a regional grouping, have influenced the Caribbean region only temporarily. This was true, for example, when Jamaica was experiencing consistent devaluations in the 1970s and 1980s. However, in time, investors were able to distinguish the countries in the region which were in difficulties and those which were not. There was no need for fixed exchange rate regimes in the Caribbean to use interest rates aggressively to defend their exchange rate from volatility in neighbouring countries with floating rates. Interest rates in neighbouring fixed exchange countries move very little when floating rate countries move rates aggressively. This is attributable to the continuing existence of some capital controls and to underdeveloped capital markets. This contrasts sharply with Argentina where the fixed exchange rate was in a context of little capital controls - prior to the crisis.

Factors such as the adequacy of the legal frame-work and the quality of the rule of law as predictors of crises have not affected the region in any significant way since the Caribbean has a history of democratic governments which are among the oldest in the Commonwealth. Political stability has for the most part been a major feature of these economies. In addition, to date, the domestic banking systems in the fixed ex-change rate regimes have for the most part been sound, well supervised and well managed. Consequently, the region with perhaps one exception has not experienced the effects which weak banking systems can have in precipitating crises. Where banking systems in any one country have come under pressure, there have been no contagion effects on other Caribbean countries. With increasing interlocking ownership systems within the region and as the Caribbean Single Market and Economy becomes effective, this situation may well change and contagion is more likely to occur.

Generally, the economic and financial similarities with Argentina are few. The similarities which do exist are not generally described as predictors of currency crises in the literature. The major similarity is the fact that some Caribbean countries, like Argentina, have fixed exchange rates. Another is in the inflexibility of the labour market, and a third is (in some Caribbean countries) high levels of unemployment. However, the similarities end very quickly, as close examination reveals fundamental differences in structure between Argentina and the Caribbean.

Conclusion

Many of the predictors of currency crises which have been discussed are general and apply to both fixed and flexible exchange rate regimes. To the extent that they tend to be more important for fixed exchange rate regimes than for floating, those countries in the Caribbean with fixed exchange rates should be mindful of these indicators. More especially, they need to ensure continuity of the peg, to be mindful of debt service capability and to be wary of high levels of short-term foreign debt. Furthermore, policy-makers must avoid large fiscal deficits, ensure foreign exchange adequacy, and build both foreign exchange and

fiscal surpluses in good times in order to provide a strong platform for coping during downturns, and must exercise care in removing all capital controls.

Where fixed exchange rate regimes extend themselves both fiscally and in terms of indebtedness, reversals can occur quickly, and options are few. They therefore need to exercise greater vigilance and greater control than floating exchange rate regimes.

Bibliography

Barclays Capital, Emerging Markets-Latin America, March, 22, 2001.

Edwards, S. 2001. "Does the Current Account Matter?" NBER's Annual Conference, (January).

Eichengreen, B., A. Rose and C. Wyplosz. 1995. "Exchange Market Mayhem: The Antecedents and Aftermath of Speculative Attacks" Economic Policy 21: 249-312.

Inter American Development Bank Country Paper. 2001. Argentina.

Hausmann, R., M. Gavin, C. Pages-Serra and E. Stein. 1999. "Financial Turmoil and the Choice of Exchange Rate Regime." IDB Working Papers Series 400, Washington, D.C.

Krugman, P. 1979. "A Model of Balance of Payments Crises." Journal of Money, Credit and Banking: 11: 311-325.

Krugman, P. 1996. "Are Currency Crises Self-fulfilling?" NBER Macroeconomic Annual.

Mussa, M. 2002. "Argentina and the Fund: From Triumph to Tragedy", Institute for International Economics, www.iie.com/papers/mussa0302

Obstfeld, M. 1984. "The Logic of Currency Crises", Cahiers Economiques et Monetaires 43: 198-213.

Sachs, J., A. Tornell, and A. Velasco. 1996. "Financial Crises in Emerging Markets: The Lessons from 1995." NBER Working Paper.

Appendix

Table 1. Argentina
Economic Indicators

	1990	1994	1995	1996	1997	1998	2000
Gross Domestic Product – Annual Growth (%)							
Total GDP	-1.3	5.8	-2.8	5.5	8.1	3.9	-3.4
Non-financial public sector – Percentage of GDP (%)							
Current revenue	20.4	19.5	18.6	16.9	18.7	18.9	18.5
Current expenditure	20.9	18.4	18.4	17.8	19.1	19.1	20.1
Balance (- Deficit)	-1.5	-0.1	-0.5	-1.9	-1.5	-1.4	-2.5
Money and Credit – Percentage of GDP (%)							
Domestic credit	21.1	25.8	26.6	26.9	27.7	31.0	33.0
Money supply (MI)	1.9	5.7	5.7	6.4	6.5	6.9	6.8
Prices							
Consumer prices (annual growth rate)	2,315.5	4.2	3.4	0.2	0.5	0.9	-1.2
Current account	4,552	-10,992	-4,985	-6,521	-11,954	-14,372	-12,293
Trade balance	8,628	-4,139	2,357	1,760	-2,123	-3,117	2,175
Exports of goods	12,354	16,023	21,161	24,043	26,431	26,441	23,333
Imports of goods	3,726	20,162	18,804	22,283	28,554	29,558	25,508
Balance on services	-674	-3,692	-3,326	-3,366	-4,178	-4,407	-4,095
Net income receipts	-4,400	-3,567	-4,529	-5,331	-6,089	-7,375	-7,922
Net current transfers	998	406	513	416	436	527	507
Capital and financial account	-2,145	12,548	6,756	11,712	16,745	17,017	13,952
Change in reserves (- increase)	-3,121	-685	82	-3,875	-3,293	-3,438	-1,201
External Debt – US$ million							
External debt	54,672	80,337	93,925	105,170	123,221	139,317	144,660
Actual debt-service payments	6,161	8,175	9,692	1,401.2	19,969	13,000	13,500

Sources: Ministry of Economic Affairs, Argentina. IDB Statistics and Quantitative Analysis Unit. IDB-ODI/REI.

Table 2. Argentina
Balance of Payments Indicators

	1999	2000	2001
ECONOMIC FORECASTS			
GDP - Real Change (%)	**-3.4**	**-0.2**	**2.5**
Balance of Payments (US$ billion)			
Current account balance	-12.4	-9.9	-9.8
Trade balance	-2.2	1.1	1.8
Exports	23.3	26.3	28.7
Imports	-25.5	-25.2	-27.0
I. External debt (US$ billion)	**144.6**	**150.4**	**156.0**
II. Fiscal balance/GDP (%)[1]	**-4.2**	**-3.6**	**-3.1**
EXPOSURE RATIOS HIGH SCENARIOS (%)			
Multilateral public debt service[2]/ External public debt service[3] (<50%)	8.3	10.4	10.8
External public debt service/ G&S exports	81.5	79.6	77.9

Sources: Ministry of Economic Affairs, IMF, FIEL, IDB-REI/ODI

[1] Consolidated public sector.

[2] Excluding debt to IMF.

[3] Based on unofficial preliminary IMF forecasts.

Table 3. Barbados
Economic Indicators
(US$ MILLIONS)

	1999	2000	2001
ECONOMIC FORECASTS			
GDP – Real Change (%)	2.9	3.0	-2.9
Balance of Payments (US$ Millions)			
Current Account Balance	-147.3	-144.9	-93.8
Trade Balance	-714.1	-743.9	-681.1
Exports	275.2	286.4	271.1
Imports	-989.4	-1030.2	-952.2
I. External Debt (US$Millions)	396.4	521.1	694.5
II. Fiscal Balance/GDP (%)	-2.3	-1.5	-3.6
EXPOSURE RATIOS HIGH SCENARIOS (%)			
Multilateral public debt service/ External public debt service	N/A	N/A	N/A
External public debt service/ G&S exports	7.45	5.4	5.3

Source: The Central Bank of Barbados' Balance of Payments Publication (2002).
The Economic and Financial Statistics (September 2002).
The Central Bank of Barbados' Forecasting Model.

Table 4. Bahamas
Economic Indicators
(US$ Millions)

	1999	2000	2001
ECONOMIC FORECASTS			
GDP – Real Change (%)	5.9	5.0	-0.5
Balance of Payments (US$ Millions)			
Current Account Balance	-409.3	-471.3	-346.8
Trade Balance	-1249.2	-1370.6	-1149.7
Exports	523.2	805.3	614.1
Imports	-1772.4	-2175.9	-1763.8
I. External Debt (US$ Millions)	105.7	115.0	124.9
II. Fiscal Balance/GDP (%)	-1.1	-0.3	-1.9
EXPOSURE RATIOS HIGH SCENARIOS (%)			
Multilateral Public Debt-Service/ External Public Debt Service	N/A	N/A	N/A
External Public Debt Service/ G&S exports	N/A	N/A	N/A

Source: The Central Bank of Bahamas *Quarterly Economic Review* (June 2002) .
CCMS Report on the Economic Performance and Convergence of the Caribbean Region (May 24, 2002).

Table 5. Belize
Economic Indicators
(US$ Millions)

	1999	2000	2001
ECONOMIC FORECASTS			
GDP – Real Change (%)	6.5	10.8	4.6
Balance of Payments (US$ Millions)			
Current Account Balance	-73.1	-151.6	-169.5
Trade Balance	-102.6	-173.2	-191.5
Exports	263.6	288.5	269.1
Imports	-366.2	-461.6	-460.6
I. External Debt (US$ Millions)	252.5	423.7	475.0
II. Fiscal Balance/GDP (%)	-1.1	-0.3	-1.9
EXPOSURE RATIOS HIGH SCENARIOS (%)			
Multilateral Public Debt service/ External Public Debt Service	N/A	N/A	N/A
External Public Debt Service/ G&S exports	N/A	N/A	N/A

Source: The Belize Statistical Digest 2001.

Table 6
Balance of Payments
OECS
(US$ Million)

	1993	1994	1995	1996	1997	1998
ECCB AREA						
Balance on Current Account	-209.4	-237.5	-212.7	-307.8	-385.9	-372.9
Goods	-678.4	-762.3	-756.3	-836.5	-933.2	-973.3
Merchandise	-694.3	-785.4	-787.8	-867.5	-968.9	-1008.7
Stores & Bunkers	15.9	23.1	31.5	31	35.7	35.4
Services (Net)	521.6	573.2	504.1	532	581.1	627.4
Transfers (Net)	50.3	69.4	164.2	124	100.5	131
Income	-102.9	-117.8	-124.8	-127.4	-134.3	-158
Capital and Financial Account (Net)	218.2	220.4	264.2	288.4	404.1	425.1
Overall Balance	8.8	-17.1	51.5	-19.4	18.2	52.2
Financing	-8.8	17.1	-51.5	19.4	-18.2	-52.2
Reserve Tranche & SDR Holding	-1	2.1	-2.2	-2.6	-0.3	-4.3
Changes in Reserves	5.7	-8.6	-49.2	22	-21.1	-53.9
ANGUILLA						
Balance on Current Account	-12.8	-11.4	-9.5	-20.3	-18.7	-19.9
Goods	-33.2	-37.4	-45.8	-51.1	-52.7	-59.8
Merchandise	-33.1	-37.3	-45.7	-51	-52.6	-59.6
Stores & Bunkers	-0.1	-0.1	-0.1	-0.1	0	-0.2
Services (Net)	27.7	36.7	27.8	29.6	37.1	41.3
Transfers (Net)	0.8	-1.4	16.1	7.4	0.7	2.4
Income	-8.1	-9.3	-7.5	-6.2	-3.8	-3.7
Capital and Financial Account (Net)	10	5.2	9.5	21.7	20.6	21.8
Overall Balance	-2.8	-6.2	0	1.4	1.9	1.8
Financing	2.8	6.2	0	-1.4	-1.9	-1.8
Reserve Tranche & SDR Holding	-0.1	0	0	0.2	0	0
Changes in Reserves	-1.1	0.2	0	-1.7	-1.9	-1.8
ANTIGUA & BARBUDA						
Balance on Current Account	-0.5	-17.9	-0.5	-59.5	-47.4	-60.4
Goods	-220.5	-253.6	-237.9	-271.1	-275.1	-283.5
Merchandise	-231.7	-267	-258.1	-289.7	-296.7	-303.5
Stores & Bunkers	11.2	13.4	20.2	18.7	21.6	20.1
Services (Net)	245.6	261.4	200.6	206.2	240.1	254.5
Transfers (Net)	-2.7	0.9	63.7	31.6	9.8	-1.9
Income	-22.9	-26.6	-26.9	-26.2	-22.2	-29.5
Capital and Financial Account (Net)	7.2	18.3	14.1	48.2	48	64.7
Overall Balance	6.7	0.4	13.6	-11.3	0.7	4.3
Financing	-6.7	-0.4	-13.6	11.3	-0.7	-4.3
Reserve Tranche & SDR Holding	0	0	0	-0.4	0	0
Changes in Reserves	12.2	-8.1	-13.6	11.7	-3	-8.7

Table 6
Balance of Payments - Continued
OECS
(US$ Million)

	1993	1994	1995	1996	1997	1998
DOMINICA						
Balance on Current Account	-22.6	-38.3	-40.7	-33.3	-25.9	-12.4
Goods	-43	-47.9	-52.9	-47.7	-50.5	-43.8
Merchandise	-43.1	-48.6	-53.9	-49.1	-51.7	-45
Stores & Bunkers	0.1	0.7	1	1.3	1.2	1.2
Services (Net)	18.1	13.5	17.6	24	31.2	34.4
Transfers (Net)	8.7	7.1	7.9	10.2	10.4	12.7
Income	-6.4	-11	-13.3	-19.7	-16.9	-15.7
Capital and Financial Account (Net)	31.5	39.9	48.9	35.1	25.6	14.1
Overall Balance	8.9	1.6	8.2	1.9	-0.3	1.7
Financing	-8.9	-1.6	-8.2	-1.9	0.3	-1.7
Reserve Tranche & SDR Holding	-0.7	-0.3	-1.2	-1.1	0	0.5
Changes in Reserves	0.4	4.4	-7	-0.8	-0.7	-3.8
GRENADA						
Balance on Current Account	-43.6	-26.9	-40.9	-55.6	-67.9	-80.3
Goods	-95.6	-94.2	-105.2	-122.5	-122.1	-137.1
Merchandise	-96.6	-96.1	-107.9	-126.4	-125.1	-141.4
Stores & Bunkers	1	1.9	2.7	3.9	3	4.3
Services (Net)	46.7	60.3	60.7	60.9	49.7	50.5
Transfers (Net)	13.7	15.8	17.1	21.4	21.5	29.2
Income	-8.4	-8.8	-13.4	-15.4	-16.9	-22.9
Capital and Financial Account (Net)	35.9	25.7	47	56	74.9	84.4
Overall Balance	-7.7	-1.2	6	0.4	7	4.1
Financing	7.7	1.2	-6	-0.4	-7	-4.2
Reserve Tranche & SDR Holding	0	-0.4	-0.5	-1.5	0	0
Changes in Reserves	-0.4	-4.1	-5.6	1	-7	-4.2
MONTSERRAT						
Balance on Current Account	-7.6	-11.8	-2	15.8	-1.9	1.8
Goods	-22	-27.1	-21.8	5.4	-19.9	-18.2
Merchandise	-22	-27	-21.7	5.5	-19.9	-18.2
Stores & Bunkers	0	-0.1	-0.1	-0.1	0	0
Services (Net)	12.1	12.9	9.8	-1.7	1	-9.3
Transfers (Net)	5.6	6.5	12.2	13.6	19.3	31.1
Income	-3.3	-4.1	-2.3	-1.5	-2.3	-1.8
Capital and Financial Account (Net)	5.7	10.8	3.1	-16	4.5	11.7
Overall Balance	-1.9	-1	1.2	-0.2	2.6	13.5
Financing	1.9	1	-1.2	0.2	-2.6	-13.5
Reserve Tranche & SDR Holding	0	-0.1	0	0	0	0
Changes in Reserves	0.4	-1.5	-1.2	0.2	-2.6	-13.5

Table 6
Balance of Payments - Concluded
OECS
(US$ Million)

	1993	1994	1995	1996	1997	1998
ST. KITTS & NEVIS						
Balance on Current Account	-29.3	-24.1	-45.5	-65.1	-61.7	-41.5
Goods	-62.7	-69.7	-80.6	-92.9	-85.5	-86.6
Merchandise	-63.3	-70.4	-81.2	-93.7	-86.4	-88.9
Stores & Bunkers	0.6	0.7	0.7	0.9	1	2.4
Services (Net)	37.3	47.8	26.9	27.2	29.6	43.4
Transfers (Net)	8	10.9	19.2	16.2	15.1	27.1
Income	-11.9	-13.1	-11	-15.6	-20.8	-25.4
Capital and Financial Account (Net)	28.9	24.9	47.8	64.2	65.3	52.6
Overall Balance	-0.4	0.8	2.3	-0.9	3.7	11.1
Financing	0.4	-0.8	-2.3	0.9	-3.7	-11.1
Reserve Tranche & SDR Holding	0.3	2.9	-0.6	0.2	-0.3	-0.3
Changes in Reserves	-3.2	-2.3	-1.7	0.7	-3.3	-10.7
ST. LUCIA						
Balance on Current Account	-49.4	-48.6	-33.1	-54.4	-78.4	-66
Goods	-140.5	-165.7	-154.7	-181.1	-222.1	-224.7
Merchandise	-144.3	-170.7	-160.3	-187.8	-231.1	-232.8
Stores & Bunkers	3.8	5	5.6	6.8	8.9	8.1
Services (Net)	115.7	132.7	141.5	147.3	169.4	184.5
Transfers (Net)	9.2	17.8	18.9	13.2	13	19.5
Income	-33.8	-33.4	-38.8	-33.8	-38.7	-45.3
Capital and Financial Account (Net)	59.9	52.4	38.8	48.1	83.3	81
Overall Balance	10.5	3.8	5.7	-6.3	4.9	15.1
Financing	-10.5	-3.8	-5.7	6.3	-4.9	-15.1
Reserve Tranche & SDR Holding	0	0	0	0	0	-5.6
Changes in Reserves	-4.4	2.4	-5.7	6.3	-4.9	-9.5
ST.VINCENT & THE GRENADINES						
Balance on Current Account	-43.7	-58.2	-40.7	-35.6	-84.1	-94.3
Goods	-61	-66.5	-57.4	-75.5	-105.3	-119.7
Merchandise	-60.3	-68.2	-59	-75.3	-105.3	-119.3
Stores & Bunkers	-0.7	1.7	1.5	-0.3	0.1	-0.4
Services (Net)	18.5	8.1	19.2	38.5	23.1	28.1
Transfers (Net)	7	11.8	9.2	10.4	10.8	11
Income	-8.2	-11.6	-11.7	-9	-12.7	-13.7
Capital and Financial Account (Net)	39.1	43.1	39.3	36	85.2	100.7
Overall Balance	-4.6	-15.1	-1.4	0.4	1.1	6.3
Financing	4.6	15.1	1.4	-0.4	-1.1	-6.3
Reserve Tranche & SDR Holding	-0.5	0	0	0	0	1.2

14

A Currency Union for the Caribbean

DeLisle Worrell

Abstract

The experiences of Caribbean Economic Community countries show that exchange rate depreciation in these countries is inflationary, and that, while changes in the relative prices of tradables may affect exports, tourism, and imports, nominal exchange rate changes have no predictable effect on those relative prices. Under these circumstances, economic literature indicates that a fixed exchange rate regime is optimal, and Caribbean countries with (quasi-) currency boards have been successful in maintaining durable exchange rate pegs. Commitment to a currency board is a potentially vital step in achieving a currency union for the Caribbean.

Introduction

Forty years ago, the region that is now the Caribbean Community (Caricom)[1] enjoyed monetary and exchange rate stability with currencies issued by two central banks (the National Bank of Haiti and the Central Bank of Suriname) and four currency boards, one of which covered almost a dozen British colonies and territories in the Eastern Caribbean. Today there are nine different currencies in the region, in two categories. Four currencies - in The Bahamas, Barbados, Belize, and the Eastern Caribbean Central

1 The member countries of CARICOM are: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. For most of the period under discussion Suriname and Haiti, which joined in 1995 and 1999, respectively, were not members.

Bank (ECCB)[2] area - are managed as quasi-currency boards,[3] pegged to the U.S. dollar, at rates which have remained unchanged since the 1970s. The remainder officially maintain floating exchange rate regimes,[4] with or without management by their central banks. Monetary union is the explicit objective of CARICOM, but an agreement for its introduction, reached in 1992, has not been implemented. This paper argues that its implementation is an important development initiative, and suggests a way forward.

This paper argues that a currency union among countries that meet defined criteria is the best option for Caribbean countries to secure a stable means of payment and a non-depreciating store of value. The criteria set down in the agreement for the Caricom currency union are, with one exception which is explained in the paper, sufficient. The common Caribbean currency should be pegged to the U.S. dollar *via* a quasi-currency board rule, following the existing model of the Eastern Caribbean Central Bank.

The next section provides background on the evolution of exchange rate policies in CARICOM countries. The third section explains why a stable, non-depreciating money in the Caribbean is best attained via an exchange rate peg. The fourth section gives the rationale for a peg to the U.S. dollar, in the form of a quasi-currency board, or dollarisation involving the abolition of domestic currencies, and explains why the quasi-currency board is the better option. The fifth section makes the argument for a common currency for the region – in preference to individual quasi-currency boards – and suggests a strategy for achieving currency unification.

---

2 The membership of the ECCB coincides with that of the Organisation of Eastern Caribbean States (OECS): Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines, with the British Virgin Islands and Anguilla as associate members.

3 The term "quasi-currency board" is used to describe regimes where the currency is backed by foreign exchange intervention at a pegged rate, and where the only sources of reserve money are foreign reserves and a limited holding of marketable government securities. A holding of less than one-third might be considered quasi-currency board behaviour.

4 Trinidad and Tobago provides a Caribbean example of what has become known as the "fear of floating" (Calvo and Reinhart, 2000). The Central Bank of Trinidad and Tobago officially maintains a floating rate regime, but in fact it invariably intervenes to prevent exchange rate fluctuation, to such an extent that the IMF classifies Trinidad and Tobago in the same group of pegged currencies as The Bahamas, Barbados, and Belize.

I. THE EVOLUTION OF EXCHANGE RATE ARRANGEMENTS IN CARICOM

At the beginning of the 1960s the countries that now constitute the CARICOM group all had stable currencies, managed, in the case of English-speaking countries, by currency boards, and denominated in sterling. The British Caribbean Currency Board (BCCB), headquartered in Port of Spain, Trinidad, issued a currency which circulated from British Guiana (now Guyana) in the south through the eastern Caribbean to St. Kitts, Nevis, and Anguilla in the north. The Jamaican currency board issued a currency which also circulated in the Cayman Islands, and there were separate boards for The Bahamas and British Honduras (now Belize). Although the majority of the region's trade and financial links were with the United States - sugar and banana exports being the main exceptions—the sterling peg occasioned no market uncertainty in a world of fixed parities. However, in 1967 the devaluation of sterling against the U.S. dollar brought an inflationary shock, as all Caribbean currency boards followed suit.

During the 1960s and 1970s countries replaced currency boards with central banks as they moved from the status of self-governing colonies to independent political units, beginning with the establishment of the Bank of Jamaica in 1961. Guyana, Trinidad and Tobago, and Barbados opted out of the BCCB to set up central banks and issue their own currencies, leaving the members of the Organisation of Eastern Caribbean States as the surviving members of the common currency arrangement, which was converted to a central bank in 1983. With the break up of the global parity system in the early 1970s the sterling peg generated uncertainty in Caribbean-U.S. dollar exchange rates, and the currencies were all switched to U.S. dollar pegs, albeit at different rates, depending on the sterling-U.S. dollar rate on the day of the switch (Clarke and Danns, 1997).[5]

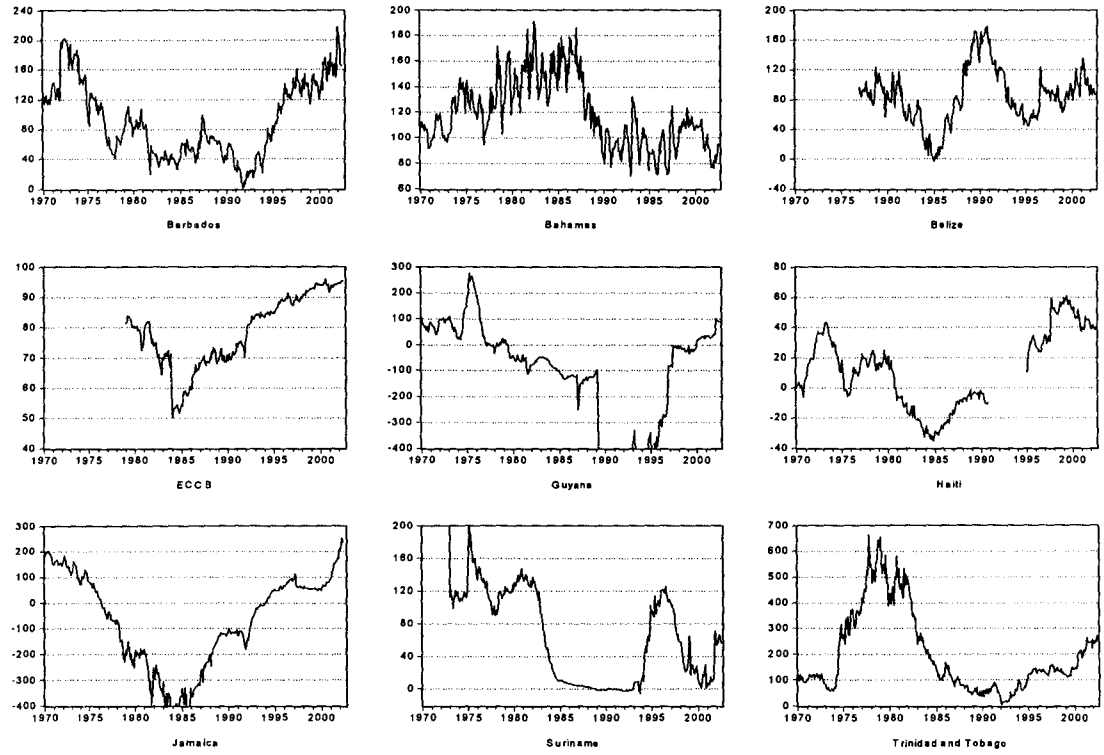
Up to the mid-1970s the new central banks behaved very much like their currency board predecessors, issuing currency in exchange for foreign exchange and maintaining an asset portfolio composed mainly of foreign exchange, with only modest lending to government and domestic financial institutions. Although not legally bound to do so, they have consistently followed a quasi-currency board strategy, maintaining levels of foreign reserves, relative to the liabilities of the central bank, such that they were always able to intervene successfully in support of the exchange rate peg. The exchange rates of The Bahamas, Barbados, Belize, and the Eastern Caribbean dollar have been managed in this way ever since. While the ECCB is the only central bank to have retained a legal prescription on the maximum holding of domestic assets, the central banks in this group have maintained reserves in excess of 50 percent of their liabilities (see Figure 1).[6] On

---

5 All except the Bahamian dollar and the Barbados dollar were valued at the exact U.S. dollar equivalent on conversion day. The Bahamian dollar was denominated on par with the U.S. dollar, and the Barbados dollar was revalued five percent to a convenient exchange rate of BDS$2.00 per U.S. dollar.

Figure 1

Ratio of Central Bank Net Foreign Assets to Reserve Money



Source: IMF, *International Financial Statistics*

two occasions when there were sustained losses of foreign reserves (Belize in 1985 and Barbados in 1991–92) major fiscal adjustment (with supporting structural measures) was undertaken to sustain the exchange rate anchor.

The quasi-currency board strategy was abandoned by the Bank of Guyana and the Bank of Jamaica in the mid-1970s, and by the Central Bank of Trinidad and Tobago in the mid-1980s (see Worrell, 1987).[7] Central bank credit to the government rose as foreign exchange reserves declined and were exhausted,

---

6 All data used for constructing the figures are drawn from the IMF's *International Financial Statistics* database, except for relative prices in Figure 4, which are calculated from national accounts data from the Central Bank of Barbados, *Annual Statistical Digest 2000.*

7 It is not possible, in the scope of this paper, to explain why some countries adopted a flexible rate regime (see Worrell, 1987). I have argued elsewhere, most recently in Worrell (2000), that appropriate, forward-looking fiscal policy is the key ingredient in successful monetary and exchange management.

and the exchange rate could no longer be sustained by foreign currency intervention. For some time an official rate was maintained, at least for some transactions, but an ever larger proportion of all transactions migrated to the parallel market over time, in spite of restrictions and foreign currency rationing. Restrictions were removed, starting in Guyana in 1988, and the exchange rates were allowed to depreciate. In the 1990s the Bank of Jamaica and the Central Bank of Trinidad and Tobago attempted to stabilize the exchange rate through interest rate policy, using indirect instruments. The Bank of Guyana has been inactive, although the pattern of exchange rate movement – not the level of the rate - in Guyana is no different from that observed in Jamaica and Trinidad and Tobago.

CARICOM central banks have maintained collaboration and cooperation among themselves, almost from their inception. However, their initiatives have not been markedly successful. A multilateral scheme for intra-Caricom transfers (the Caricom Multilateral Clearing Facility, CMCF), which was set up in 1977 and operated successfully for several years, was wound up in 1983 when Guyana accumulated large arrears as a result of a prolonged balance of payments crisis. A scheme for regional travellers cheques, denominated in Trinidad and Tobago dollars, never gained wide acceptance because the depreciation of the Trinidad and Tobago dollar rendered it unacceptable outside that country. The most recent initiative, the implementation of a monetary union in two phases, was agreed in 1992, but implementation remains stalled. Just when it appeared that countries comprising more than 50 percent of aggregate regional GDP[8] had met the criteria for implementing Phase One of the agreement, Caricom's largest economy, Trinidad and Tobago, failed the crucial exchange rate stability test.

II. EFFECTS OF EXCHANGE RATE CHANGES

In the CARICOM experience of the past thirty years, it has been possible to maintain stable, low inflation in economies with sustained growth only in the context of exchange rates pegged to the dollar under quasi currency board rules, either *de jure* or *de facto*. The nominal exchange rate has proven ineffective as a shock absorber or adjustment policy tool, because neither the external commodity nor the external financial market has a market-equilibrating mechanism based on the exchange rate. An increase in the price of foreign exchange does not provoke an increase in the net supply of foreign exchange, nor does a fall in the price of foreign exchange induce an increase in the net demand for foreign exchange, in either market. To see why, let us consider separately the goods and services and financial markets.

---

8 That is, all CARICOM members, except Guyana, Jamaica and Suriname.

A. The Market for Traded Goods and Services

Conventional theory leads us to expect that an increase in the relative price of tradables induces an increase in the domestic supply of tradables, a fall in the domestic demand for tradables, a fall in the domestic supply of non-tradables, and an increase in the domestic demand for non-tradables, if not in the short run, then in the medium or long run. A useful summary of the conventional view may be found in Isard and Faruqee (1998). In their model the current account balance is a decreasing function of the real effective exchange rate, implying that a (real) depreciation improves the current account balance. Both exports and imports are affected by exchange rate changes, as well as by foreign and domestic real incomes, respectively.

However, consider the composition of the tradable sector in the typical Caribbean country: it comprises one or two of the following: tourism, a major agricultural staple (bananas, sugar, or rice), a mineral (oil or bauxite), and the manufacture of beverages (mainly rum). (See Table 1). In each of these activities supply is constrained by domestic capacity, while domestic demand absorbs nothing (in the case of bauxite) or a very small proportion of production (see Table 2). The effect of changes in relative prices on net domestic supply is therefore negligible in the short run. The effect of relative price changes in the medium and long term must be considered along with other factors that affect investment decisions: changes in technology, changes in taste, marketing initiatives, and changes in the international ownership of domestic capital. Let us consider each export sector in turn.

Investment in hotels in the Caribbean in recent times has been influenced by cycles in the overall growth of resort tourism,[9] the increasing popularity of cruise tourism, the increasing preference for prepaid "all inclusive" arrangements, the effects of airline deregulation, the impact of computerization and the internet on travel patterns and industry organization, and the emergence of new resorts in the Caribbean and in competing tropical destinations (Poon, 1993). Investment in the sugar industry has been affected by changes in protective export arrangements, changes in agrarian technology and practice in the Caribbean and in competing sugar exporting countries, ecological and health concerns affecting production processes and consumption patterns, and investment in associated industries, especially rum production. Funding for investment in the banana industry has been provided by the European Union, in anticipation of changes in negotiated agreements with the Community. The main factors in investment in the rice industry were the liberalization of investment and trade in Guyana in the 1980s and the provisions of the Lomé Agreement with the European Union. In addition to the impact of product-specific investment, the supply of all agricultural products was affected by weather (including hurricanes, flood, and drought) and other natural phenomena.

---

9 The impact of the current economic slowdown in industrial countries is not yet clear. Some investment which was under way, or at an advanced stage of planning, has gone ahead, but much potential investment is on hold.

Table 1. Exports of Goods and Services, by Sector

	Tourism	Petrol-eum, Minerals	Enclave Mfg. 1/	Other Mfg. 1/	Sugar	Other Agri.	IFSCs 2/	All Exports 3/
Antigua and Barbuda	94.5	0.0	n.a.	5.5	0.0	n.a.	n.a.	100.0
Bahamas 4/	74.1	0.0	n.a.	20.8	0.0	0.0	5.0	99.9
Barbados 4/	74.2	0.0	2.1	11.4	2.7	2.6	7.0	100.0
Belize	42.6	0.0	5.4	6.6	10.6	34.8	n.a.	100.0
Dominica	53.0	0.0	15.4	22.5	0.0	9.0	0.0	99.9
Grenada 4/	56.3	0.0	23.9	12.8	0.0	6.9	n.a.	99.9
Guyana 4/	0.0	38.0	n.a.	10.0	24.0	28	0.0	100.0
Haiti	31.4	0.0	57.0	n.a.	n.a.	11.7	0.0	100.1
Jamaica 4/	48.2	25.9	8.0	14.3	2.8	0.8	0.0	100.0
St. Lucia 4/	84.1	0.0	0.7	5.6	0.0	9.6	0.0	100.0
St. Vincent & the Grenadines	63.2	0.0	n.a.	24.9	0.0	11.9	n.a.	100.0
Suriname	0.0	77.1	n.a.	11.8	n.a.	11.1	0.0	100.0
Trinidad and Tobago 4/	n.a.	66.0	4.1	29.0	0.9	n.a.	0.0	100.0

1/ Where data on enclave manufacturing are not available, the conservative assumption is made that two-thirds of all manufacturing—including enclave manufacturing—is consumed domestically.

2/ Where data are not available, the international financial service sector is aggregated with tourism.

3/ Discrepancies due to rounding.

4/ 2000.

Sources: IMF Staff Country Reports, various issues; Central Bank of Barbados, *Annual Statistical Digest*, 2001; and Bank of Guyana, *Half Year Report and Statistical Bulletin*

Table 2. Exports as a Percentageof Production of Exportables, 2001 1/

	Tourism	Petrol-eum, Minerals	Enclave Mfg.	Other Mfg. 2/	Sugar	Other Agri. 2/	IFSCs 3/	All Exports
Antigua and Barbuda	100.0	....	100.0	33.3	....	33.3	100.0	96.2
Bahamas 4/	100.0	....	100.0	33.3	....	33.3	100.0	86.0
Barbados 4/	100.0	0.0	100.0	33.3	93.8	33.3	100.0	84.4
Belize	100.0	....	100.0	33.3	86.1	28.6	....	87.9
Dominica	100.0	....	100.0	33.3	....	80.0	....	87.9
Grenada 4/	100.0	....	100.0	33.3	...	3.3	....	89.0
Guyana 4/	....	100.0	100.0	33.3	100.0	33.3	....	85.5
Haiti	100.0	....	100.0	33.3	n.a.	33.3	....	89.0
Jamaica 4/	100.0	100.0	100.0	33.3	83.0	33.3	....	90.0
St. Lucia 4/	100.0	....	100.0	33.3	....	100.0	....	96.9
St. Vincent & the Grenadines	100.0	....	100.0	33.3	....	33.3	....	83.5
Suriname	....	100.0	....	33.3	....	33.3	....	88.6
Trinidad and Tobago 4/	....	100.0	100.0	33.3	85.0	33.3	....	86.5

1/ Exports of goods and services. The notation .... indicates that the country does not produce that commodity.

2/ Where actual data are not available, a conservative assumption is made, that only one-third of the production of miscellaneous exportables is exported.

3/ International financial services centers.

4/ 2000.

Sources: IMF Staff Country Reports, various issues; Central Bank of Barbados, *Annual Statistical Digest*, 2001; and Bank of Guyana, *Half Year Report and Statistical Bulletin.*

Investment in the petroleum and bauxite/alumina industries has responded to changes in world prices, the cost of extraction of domestic deposits, and the changing nature of international competition in these industries. Investment in mineral and agricultural export sectors has been seriously inhibited by market uncertainty. Except for petroleum and related sectors, there has been little or no expansion of capacity. Investment has financed rehabilitation and productivity upgrades to maintain competitiveness, sustain output levels, or slow the pace of output loss.

Product prices, relative to costs and competing supplies of similar quality, have undoubtedly been a factor in investment decisions in the sectors discussed above. However, it is impossible to predict the importance of relative price changes, in view of the complexity of decision processes just described. It may be that relative prices have an effect comparable to that of the non-price factors, but they may be less significant or negligible in comparison, or they may have perverse effects, in cases where price is seen as a reflection of quality.

The typical composition of the non-tradable sector in Caricom countries is wholesale and retail services, government services, business and personal services, and public utilities. None of these is substitutable for tradable goods, in production or consumption. The resources – skills, machines, and structures – used in the production of these non-tradables may not be costlessly reallocated to the production of the tradables mentioned above: "defenders of floating exchange rates ... point to the fact that flexible exchange rates make the adjustment of relative prices less costly, because equilibrium changes can be accommodated by a higher or a lower exchange rate with little effect on output and employment ... However, in a realistic economy there are several distinct goods, each with a *distinct* labor market: gauchos cannot be quickly retrained as nuclear physicists, and vice versa" (Calvo and Reinhart, 1999, p. 21). Major initiatives for retraining were incorporated in adjustment programs for Trinidad and Tobago (1985-86), Guyana (1988–89), Barbados (1991–92) and Jamaica, on several occasions since the mid-1970s, none of which may be considered an unqualified success.

B. Nominal and Real Exchange Rates

The effects discussed above depend on changes in the relative prices of tradables. However, in the Caribbean no predictable relationship has been established between the nominal exchange rate, the policy instrument, and relative prices. A simple linear relationship would obtain only if: (a) there were no change in the fiscal deficit or government's financial requirements as a result of the exchange rate change; (b) there were no interest rate response; (c) there were no induced capital flows; and (d) there were no wealth effects on aggregate demand, credit, and financial accumulation. Since none of these restrictions hold, the relationship between nominal exchange rate changes and changes in relative prices is complex. It will reflect the interrelationships of the variables, both contemporaneously and after allowing for lagged effects. No one has attempted an exchange rate model that allows for such interrelationships for Caribbean countries.

However, there are reasons, based on the structure of Caribbean economies, why nominal devaluations are not expected to produce large changes in real exchange rates, except in the short term. Devaluation drives a wedge between domestic (i.e., non-tradable) producer prices and foreign (i.e., tradable) prices, to the extent that non-tradables do not require imported inputs. In the Caribbean the imported content of non-tradables is very high, for all commodities produced, and the staples of the diet and other basic consumption goods are also imported. In these circumstances, the pressures to adjust nominal wages to exchange rate changes are especially strong and persistent.

Nevertheless, unless labour markets anticipate devaluations, wage costs catch up with prices only with a lag. As Lewis (1972) anticipated, this appears to have provided a temporary profit windfall for tradables producers which was used for a one-shot investment injection, on at least one occasion.[10] This is not a strategy that can be repeated: unless labour markets are convinced that the new exchange rate will persist, devaluation expectations may become entrenched, causing overreaction and an eventual appreciation in the real exchange rate. Moreover, evidence is accumulating, world wide, about the disincentive effects of exchange rate uncertainty on investment (Pindyck, 1991), exports (Arize, 1996), and the long-term growth of capital markets (Reinhart, 2001), though the interpretation of this evidence has occasioned controversy (see for example, Böhm and Funke, 2001).[11]

Unfortunately, much of the empirical literature on the effects of exchange rate changes uses inadequate measures of the real exchange rate. For countries whose exports are too small a proportion to affect world market prices (or prices in the target consumption markets), the most representative measure of relative prices is the relative price of tradables to non-tradables. Marsh and Tokarick (1994) and Bynoe-Mayers (1997) discuss the disparity between this statistic and the usual empirical measure, the nominal exchange rate adjusted by indices of relative consumer or wholesale prices at home and abroad. (A similar discrepancy is highlighted in Masters and Ianchovichina, 1998.)

C. The Financial Market

Mechanisms exist in Caribbean financial markets for full interest rate arbitrage, allowing domestic interest rates to adjust to the level of comparable U.S. interest rates, the expected exchange rate change, and expected changes in the domestic rate itself (if, for example, the fiscal deficit or a decline in foreign exchange reserves is deemed unsustainable by market participants). These mechanisms include: foreign ownership of domestic banks and other financial

---

10 Anecdotal evidence exists that exporters in Trinidad and Tobago took advantage of devaluation-induced profits to retool for improved competitiveness.

11 The Jamaican experience of repeated devaluation, which contrasts with Trinidad and Tobago's single major devaluation in the past decade and a half, provides anecdotal support for the disincentive effect of repeated exchange rate changes on fixed capital formation.

institutions, foreign correspondent links by domestic financial institutions, shifts in trade credit (equivalent to 50 percent of exports of goods and services in some Caricom countries), changes in the patterns of remittances (for example, substitution between services in kind and foreign exchange transfers), and the use of informal channels of financial transfer. Through interest rate arbitrage, an expected change in the nominal exchange rate can be discounted in the domestic financial market, and it therefore provokes no change in the net supply of foreign exchange.[12]

Exchange rate changes tend to be offset by interest rate changes, without any foreign exchange supply response, and the increased exchange rate uncertainty that comes with a flexible exchange rate brings with it a higher interest cost. Figure 2 illustrates the interest premiums which resulted from exchange rate uncertainty in a selection of Caribbean countries. It may be seen that the domestic Treasury bill rates in Jamaica and Guyana were very much higher than the U.S. Treasury bill rate, after their exchange regimes were liberalized in 1991 and 1988, respectively. The premium which the Government of Trinidad and Tobago paid on Treasury bills, compared to U.S. rates, was also higher after the exchange rate was allowed to float officially in 1993, although the differential is less pronounced than for Jamaica and Guyana. It may be seen that the premium on the domestic Treasury bill is much higher for Jamaica and Guyana than for The Bahamas, which maintained a fixed exchange rate. The premium on the Trinidad and Tobago rate is also above that for The Bahamas, though much lower than for Jamaica and Guyana. It mirrors the relative stability of the Trinidad and Tobago dollar, which has changed much less in value since the exchange rate was floated, than for the other two countries.

While expected exchange rate movements tend to be offset by changes in the interest rate, unexpected exchange rate changes have had asymmetrical effects. Unexpected revaluation of the exchange rate failed to induce any reaction in Jamaica in 1993 and 1996,[13] as market participants waited to see whether the revaluation would be sustained. The reaction to unexpected devaluation has been capital flight, in Guyana, Jamaica, and Trinidad and Tobago, as market participants sought to insure against the possibility of future devaluations.

The Caricom experience of exchange rates and the capital account follows a well-established pattern. A devaluation,[14] rather than increasing the supply of foreign exchange on the financial market, leads to capital flight in the short

---

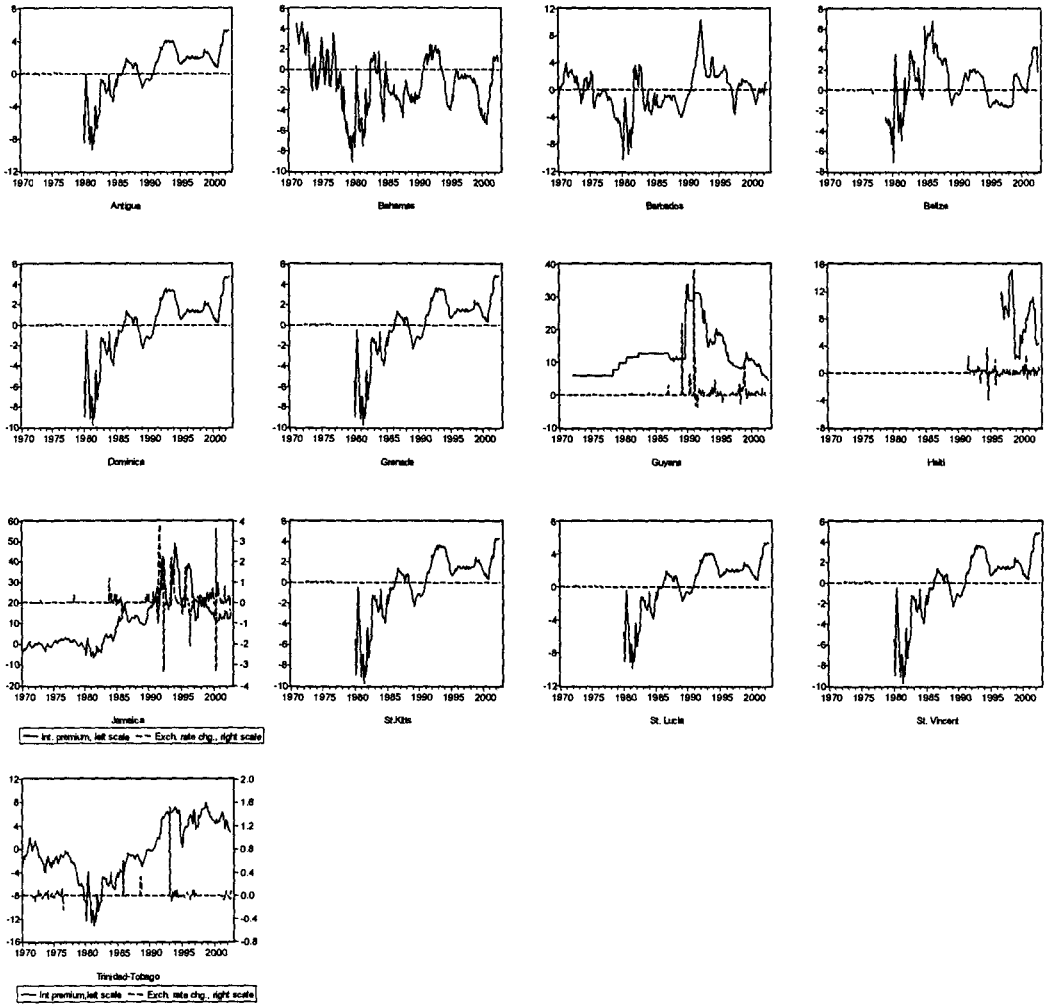
12 For a taxonomy of the interaction of interest rates, exchange rates, and capital flows in the Caribbean, see Worrell (1996).

13 These were the only significant revaluations in the 1990s. Other revaluations that appear in Figure 2 (Guyana, 1999; Jamaica, 2000; Trinidad and Tobago, 1999) can be seen to be corrections of a previous period's devaluation (in the case of Trinidad and Tobago) or were themselves corrected in the next period.

14 Devaluation may be official or more frequently, on the parallel market, with an unchanged official rate. Subsequent adjustment to close the gap between the official and parallel rates is referred to as exchange rate unification, rather than devaluation.

Figure 2

. Treasury Bill Interest Differentials,Caricom Minus US, and Exchange Rate Changes



Source: IMF, *International Financial Statistics*

term. Moreover, exchange rate expectations are heavily influenced by previous exchange rate experience. Devaluation typically is followed by a period of high domestic interest rates, relative to U.S. rates, reflecting expectations of further depreciation. In an environment of high interest rates, the yield curve often becomes inverted, finance tends toward the short term, and the investment/GDP ratio declines. In the conventional theory of exchange rate adjustment, in an economy with rational expectations the real exchange rate would converge on its long-term equilibrium value, and at this rate there would be a balance of saving and investment, determined by economic fundamentals such as income per capita, the fiscal deficit, the extent of spare capacity, real wages, and the ratio of dependents to the total population (Isard and Faruqee, 1998). In practice, the persistence of high interest rates may cause a financial position that would otherwise be viable to explode into crisis (Hausmann *et. al.,* 1999). A deliberate policy of fighting high inflation with high interest rates may also be destabilizing, in terms of actual output (Calvo and Vegh, 1995).

D. The Empirical Evidence

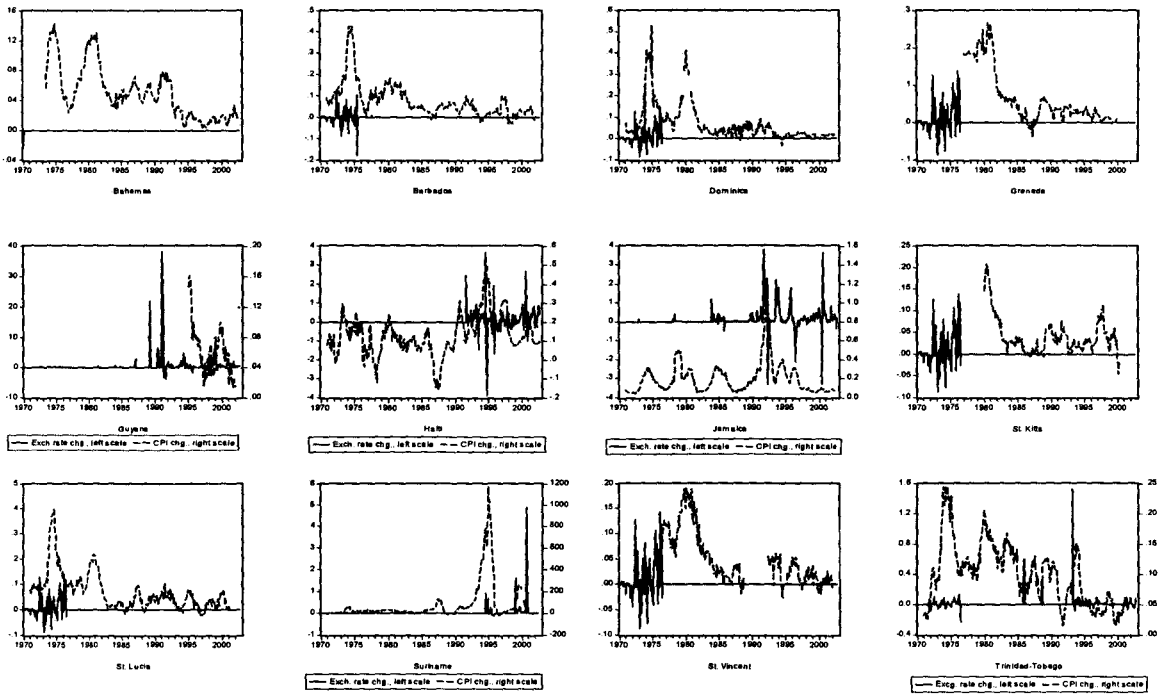
The Raw Data

A preliminary examination was made to see whether the raw data reveal an apparent balance of payments response to exchange rate changes, beginning with a comparison of exchange rate changes and inflation. To the extent that changes in the exchange rate are correlated with inflation, any relative price advantage the country may have gained from a devaluation is eroded. Figure 3 compares exchange rate changes and changes in the CPI, for three countries with flexible exchange rates (Haiti, Jamaica, and Trinidad and Tobago), Suriname, where the unofficial rate soared in the 1990s, and countries with fixed exchange rates. Jamaica and Suriname offer the most noticeable cases where domestic inflation is correlated with exchange rate depreciation, for Jamaica in 1978–79, 1984, and 1992–96, and for Suriname in 1994–95 and 1999. In Trinidad and Tobago, devaluations in 1985, 1989, and 1993 show less marked correlation with changes in the CPI; in the case of the 1985 devaluation, the corresponding price increase seems to have occurred about one year later. In Haiti high volatility of the exchange rate appears to be correlated with high inflation, in the 1990s.

Figure 4 compares nominal exchange rate changes with changes in the real exchange rate, measured as the ratio of the deflator for tradable goods to the deflator for non-tradables. The series of devaluations in Guyana in the second half of the 1980s correlates with the depreciation of the relative price of tradables in that country, though it is the nominal exchange rate change which lags the change in relative prices. In Barbados, Jamaica, and Trinidad and Tobago there is no correlation between the trends in relative prices and in exchange rates.

Figure 3

Exchange Rate Changes and CPI Inflation



Source: *International Financial Statistics.*

Figure 4
Trends in Relative Price deflators (Left Scale) and Exchange Rates (Right Scale)

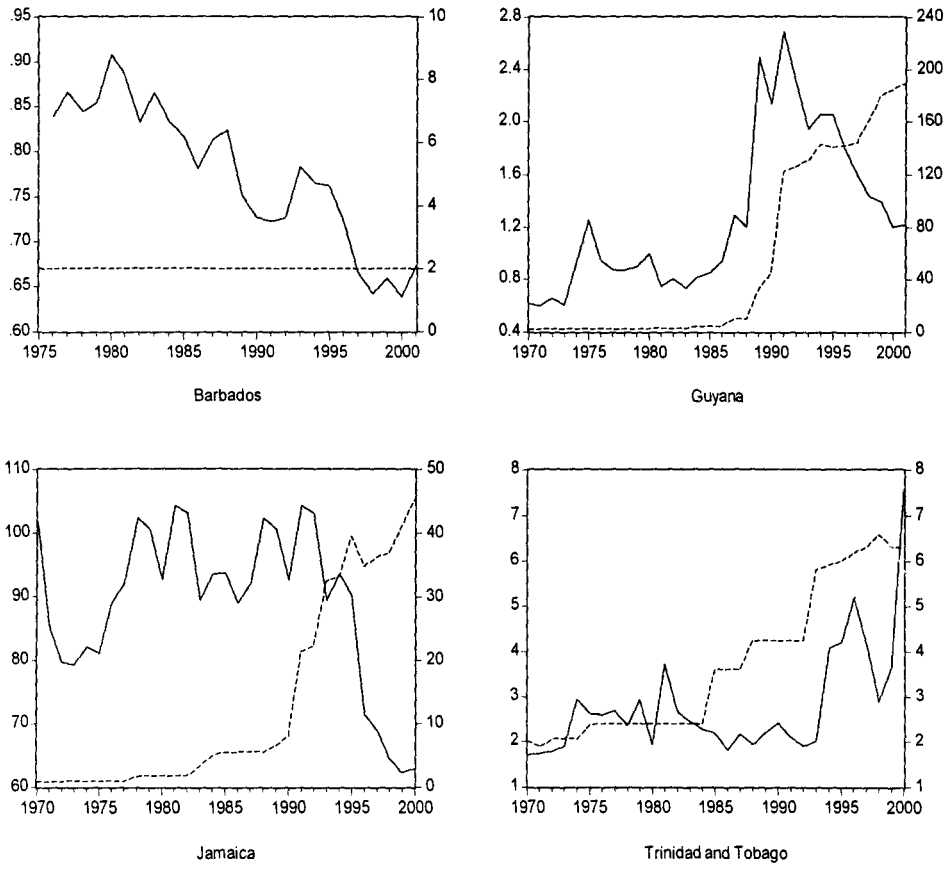
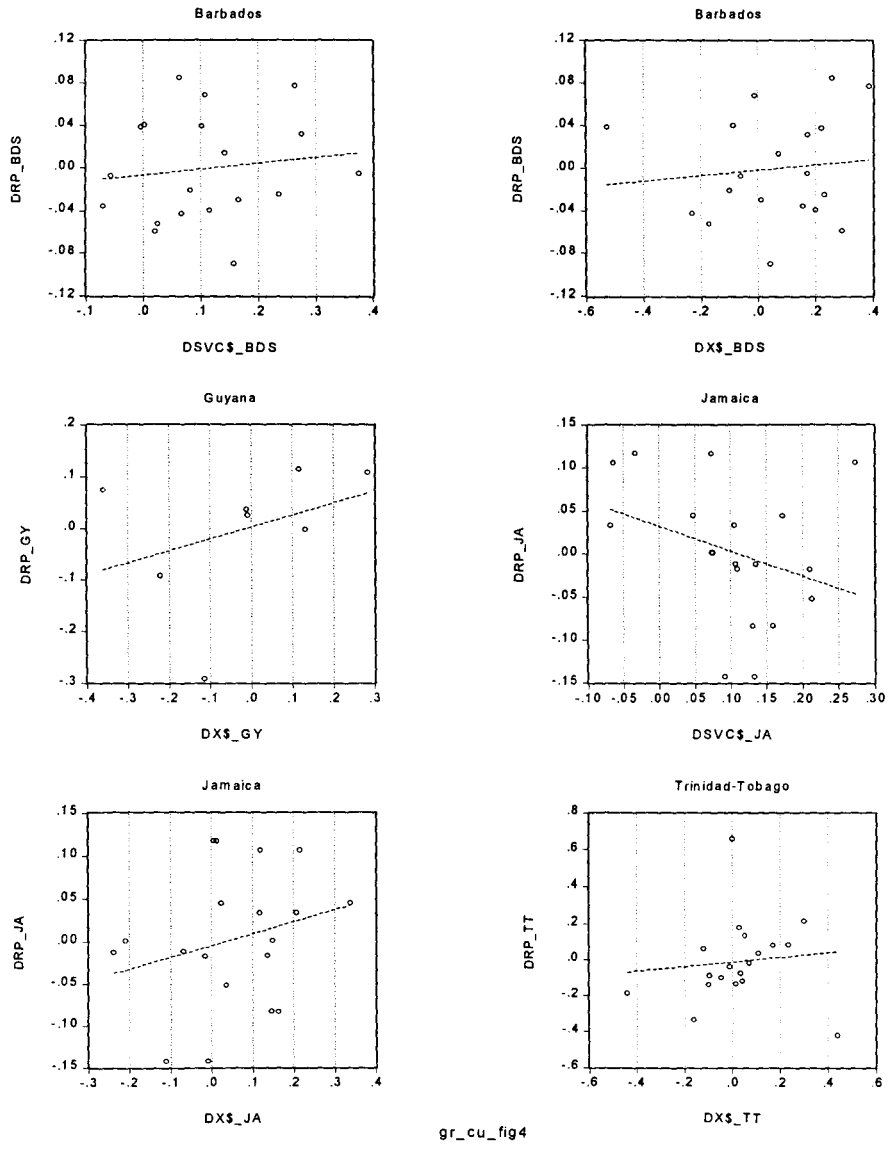


Figure 5 shows the relationship between change in the relative prices of tradables and changes in exports of goods and services (proportionate changes, based on exports and services measured in U.S. dollars), for Barbados, Guyana, Jamaica, and Trinidad and Tobago. In no case is there an obvious correlation: observations are scattered apparently at random around the fitted lines, and there is no convincing trend in any of the fitted lines. The same is true for changes in imports for Barbados, Jamaica, and Trinidad and Tobago (based on imports measured in U.S. dollars), shown in Figure 6, and for current account balances (in U.S. dollars), shown in Figure 7. Only in Barbados is there a noticeable trend in Figure 7, for an improvement in the current account as the relative price of tradables falls, that is, as the country becomes less competitive, a counter intuitive result.

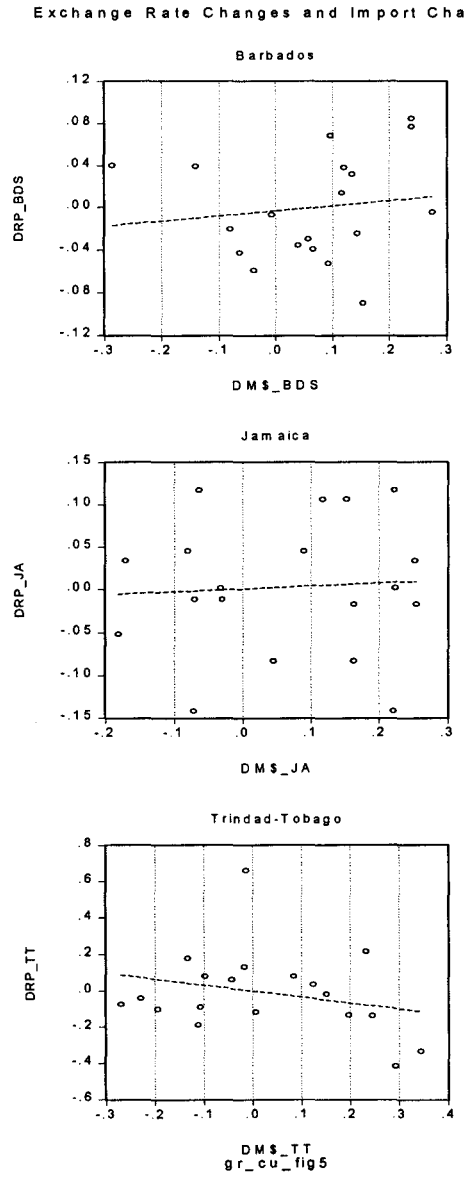
Figure 5

Exchange Rate Changes and Export Changes



Source: IMF, *International Financial Statistics.*

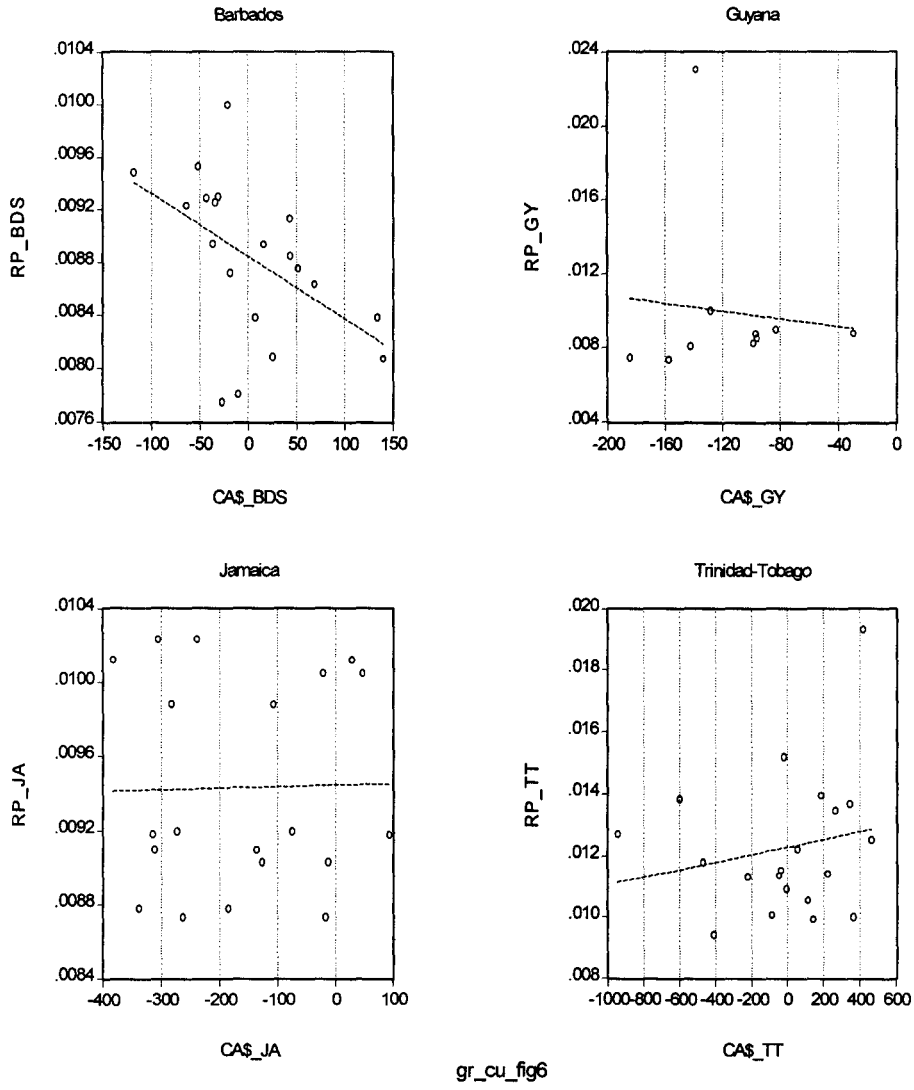
Figure 6



Source: IMF, *International Financial Statistics.*

Figure 7

Exchange Rate Changes and the Current Account



Source: IMF, *International Financial Statistics.*

This first look at the raw data is merely suggestive, because it takes no account of multivariate influences on prices, exports, services, imports, or the current account, or of possible lagged effects and indirect and simultaneous influences.

A Survey of Empirical Studies

There appears to have been no attempt to estimate the effects of exchange rate policy using a global approach that allows for time lags, and simultaneous and indirect effects of the exchange rate on the demand and supply of foreign exchange. Structural models exist that might have been adapted for that purpose, but none have been used to simulate the effects of exchange rate changes. All the evidence we have, therefore, relates to the partial impact of exchange rate changes, and must be approached with the caveat that these effects may be negated by other consequences of exchange rate changes which also impact the balance of payments, or that the effects may wear off with the passage of time.

In a study of the export performance of Barbados, Costa Rica, the Dominican Republic, Jamaica, and Trinidad and Tobago, Harris (1994) found that depreciation of the exchange rate (adjusted for weighted changes in domestic prices relative to prices in trading partners) generated increases in exports, with an elasticity of 0.17 (a 10 percent devaluation induces a 1.7 percent increase in exports), on average for this group of countries. (Other factors contributing to export changes included capital inflows, the ratio of arable land to population, and the ratio of investment to GDP.) McIntyre (1995) found that the elasticity of clothing exports with respect to the real effective exchange rates (REER), measured as above, was greater than unity, for Barbados, Costa Rica, and the Dominican Republic. For total exports, the REER elasticity was statistically significant only for Trinidad and Tobago, with a value of 0.75. McIntyre notes that the REER may be adjusted by the use of incentives, as well as by nominal exchange rate changes. (In McIntyre's tests the national capital stock also appears as an important explanatory variable, especially for clothing exports.) Worrell, Boamah, and Campbell (1996) observed that repeated devaluations by the Dominican Republic, Guyana, and Jamaica reduced their prices, wages and unit labor costs, relative to those for Barbados. In tourism, Barbados' earnings grew more slowly than those of the Dominican Republic and Jamaica, and Barbados' agricultural exports also grew more slowly than for the three comparator countries. In manufacturing, a minor export for Barbados, the country's exports grew more quickly than Guyana's and Jamaica's, and kept pace with growth in the Dominican Republic.

Inferences about the possible impact of a devaluation on tourism may be drawn from the price elasticity estimates to be found in Clarke, Wood and Worrell (1986), Rosenweig (1988), and Whitehall and Greenidge (2000). In the most detailed tourism demand study reported for any Caribbean country, Clarke, Wood and Worrell estimated equations for Barbados, separately by tourists' country of origin, type of accommodation, and season of travel. The variable that captures competition from other Caribbean destinations – hotel rates in Antigua - has no statistically significant impact on any segment of tourism demand. In contrast, Rosensweig found significant price elasticities of substitution among Caribbean countries (1.33), between the Caribbean and Mexico (1.85), and between Europe

and the Caribbean (1.78), all for visitors from the United States. Elasticities of substitution among Caribbean countries and between the Caribbean and Mexico were even higher for the worldwide tourism market. Whitehall and Greenidge found a much smaller value, 0.68, for the elasticity of Barbados' tourism with respect to relative prices, measured as the Barbados GDP deflator relative to the U.S. CPI.

Inferences about the direct, first-round impact of devaluation may be drawn from the estimated coefficients of import and export equations in structural models, even though the models were not simulated for the effects of exchange rate changes. Watson and Teelucksingh (1997) found a significant import decline in response to an increase in the unit value of imports relative to domestic prices in Trinidad and Tobago. The coefficient of export changes with respect to changes in the unit value of exports relative to a world price index is not significant. World price changes have a significant impact on domestic inflation. In a later study - Watson and Teelucksingh (2000) - the same authors estimate a significant increase in exports in response to a fall in the domestic price of exports relative to the local currency equivalent of U.S. industrial prices. Worrell (1987) found that the price of tradables relative to that of nontradables (measured by deflators) had no significant effect on the output of nontradables in Barbados or Jamaica, or on imports to Jamaica. However, an increase in the relative price of tradables significantly depressed Barbados' imports. In a later study, Worrell (1992) completed estimates for the Dominican Republic, Guyana, and Trinidad and Tobago as well, with additional observations. The relative price impact on Jamaica's imports and on the output of nontradables for Barbados were statistically significant, but all others were not. Increases in the price of tradables elicited a statistically significant increase in the output of tradables only for Jamaica.

A majority of studies indicate that changes in nominal exchange rates strongly affect domestic prices, and therefore can have only weak effects on relative prices. In the most comprehensive estimation of inflation formation for Barbados, Jamaica, and Trinidad and Tobago, Holder and Worrell (1985) estimate one-to-one impact of foreign price changes on the domestic price of tradables, affecting about one-third of production in each country, plus significant effects on foreign prices on the prices of nontradables in Barbados and Trinidad and Tobago (for Jamaica the coefficient measuring this impact was not statistically significant), as well as an inflationary impact of changes in the relative price of tradables on domestic consumer prices in Barbados. Lattie (2000) obtains a statistically significant coefficient of 0.3 for the effect of lagged exchange rate changes on domestic inflation in Jamaica, and Cumberbatch (1997) estimates a high elasticity of 4.0 for the impact of foreign prices on Barbados' consumer price index. Other studies which estimate a significant impact of foreign prices on domestic prices for Barbados include Coppin (1993) and Downes, Holder, and Leon (1990), with elasticities of 0.09 and 0.25, respectively.

Overall, the empirical results available in the literature indicate a vigorous domestic price response to exchange rate changes, though estimated elasticities vary from one-third to much greater than unity. In other respects, the results are a mixed bag. While a majority of studies do indicate some influence of changes in relative prices on exports of goods and services and on imports, the results are

not consistent across studies, and the approaches are too diverse to have produced robust inferences.

Scepticism about an active exchange rate strategy for CARICOM countries is reinforced by growing sentiment, reflected in the literature, that exchange rate flexibility is inappropriate for small open economies such as CARICOM member states. CARICOM members satisfy most of the criteria suggested by a survey summarized in IMF (1997) for countries for which a pegged exchange rate might be advantageous: small size, economies that are very open to international trade and finance, a high degree of export concentration,[15] an overwhelming proportion of external transactions conducted in a single foreign currency (the U.S. dollar), low inflation (except for Jamaica and Suriname), and a relatively high incidence of domestic nominal shocks. Dornbusch (2001) makes the case for more widespread use of currency boards, including for countries much larger than Caricom members. In their advice to countries seeking greater flexibility in exchange rate management, Eichengreen *et. al.* (1998) recognize that tourism-based economies, and economies that trade with large neighbors, gain little from independent monetary policy, and therefore recommend exchange rate pegs in these cases. Moreover, there is evidence that many small countries around the world do in fact peg their currencies by intervention, either directly or via financial markets, irrespective of the formal status of their exchange rate regimes (Calvo and Reinhart, 2000).

III. CURRENCY BOARD AND FULL DOLLARIZATION

The foregoing points firmly in the direction of a fixed exchange rate regime for Caricom member countries: the market for traded goods and services is so structured that nominal exchange rates do not have significant expenditure switching effects, either in the short run (on the demand side) or in the long run (on the supply side); the relationship between nominal and real exchange rate changes, if it exists, is tenuous and unpredictable; the financial market is quite open, neutralizing expected exchange rate effects and penalizing unexpected changes with high investment costs; and the empirical evidence is fully consistent with these inferences.

The choice of an exchange rate peg is also straightforward, for Caricom member countries, because foreign transactions, both financial and on the current account, are overwhelmingly denominated in U.S. dollars. The entire Caribbean tourism product is priced in U.S. dollars, and all private foreign capital flows are dollar-denominated. Of countries with significant extra-regional exports other than tourism, all except Suriname earn 50 percent or more of their income in U.S. dollars. One-third to half of imports come from the United States, and much of the remainder is priced in U.S. dollars (see Worrell, 1993). With the decline in agricultural exports throughout the region, changes in the U.S. dollar value of

15 An analysis of size, openness, and export concentration appears in Carter (1997).

sterling and the euro have relatively little impact, and no other currency is of importance in the international transactions of Caricom countries.[16]

The risk of an exchange rate crisis, resulting in catastrophic devaluation, is the only real cost of the pegged exchange rate in Caricom countries. This follows from the absence of predictable exchange rate effects of nominal exchange rate changes, implying that surrendering the exchange rate tool entails no loss in the armoury of effective stabilization policies. In practice, only those Caricom currencies which were managed as quasi-currency boards have managed to avoid exchange rate crises. With relatively open financial markets, high levels of reserve backing appear to be an essential element in insuring against currency risk, even when fiscal and macroeconomic policies are fully consistent with the exchange rate.

The alternative, which eliminates currency risk altogether, is full dollarization. There are two well-established arguments for preferring the currency board over dollarisation: the former allows for limited seigniorage accruing to the currency-issuing authority,[17] and that authority may serve as lender of last resort for domestic financial institutions which have no recourse beyond the interbank market if the economy is fully dollarised.[18] This puts domestic financial institutions at a disadvantage, in competition with banks which have recourse to an overseas head office.

There is a third and possibly stronger argument for the quasi-currency board: it lends credibility to domestic policy, especially fiscal policy (Baliño *et. al.*, 1997), because it is a very transparent mechanism. In the Caribbean, this is demonstrated by the recent economic history of The Bahamas, Barbados, Belize, and the OECS member states. Central banks in these countries have all followed quasi-currency board rules, de facto (or, in the case of member countries of the ECCB, de jure). On the whole, they maintained ratios of foreign exchange reserves close to or exceeding the value of their currency liabilities. Both Belize (in 1985) and Barbados (in 1991–92) came close to exhausting foreign reserves completely, but restored adequate levels by means of programmes to reduce aggregate expenditure, thereby demonstrating credible commitment to the exchange rate peg. In the central banking era in the Caribbean – from the late 1960s to the present – these countries have experienced structural changes and economic shocks similar to those

---

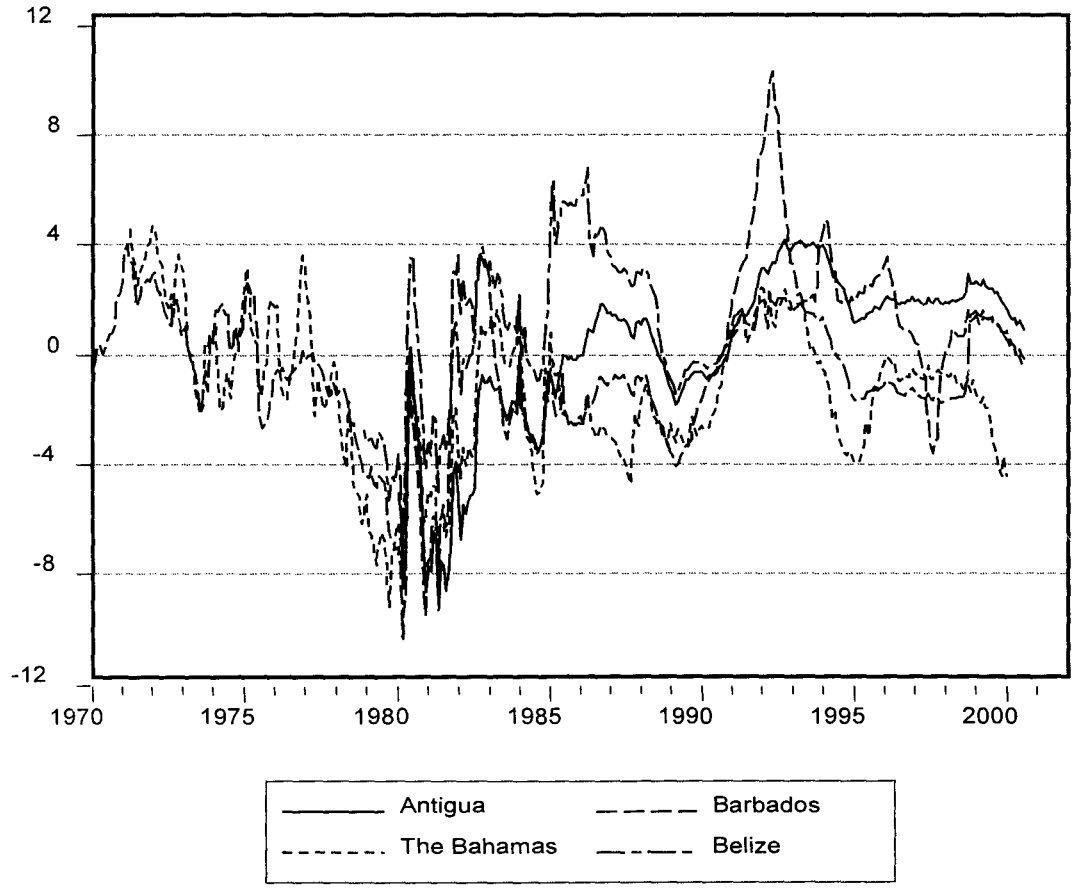
16 Caricom countries do not face the dilemma of small open economies with commercial and financial ties to two or more currency areas, where the gains from pegging to a single currency must be weighed against the instability and competitive losses such a peg entails. In this regard Caricom's problem resembles that of smaller European countries (Argy and De Grauwe, 1990) rather than that of Argentina or New Zealand.

17 Anthony and Hughes-Hallet (1999) argue for full dollarisation of Caricom countries on the grounds that seigniorage revenues are less than the transactions costs of transfers from local currencies to the U.S. dollar.

18 Dornbusch (2001) argues persuasively that the lender-of-last-resort function properly belongs with the Treasury or with world capital markets.

experienced by Jamaica and the Dominican Republic, countries where central banks did not operate de facto as quasi-currency boards.[19] The governments of the quasi-currency board countries have enjoyed ongoing credibility for fiscal policies, in contrast to the experiences of Jamaica and the Dominican Republic, and have been able to borrow at interest rates which show only a small premium over comparable U.S. dollar interest rates (see Figure 8).[20]

Figure 8
Interest Rate Premiums, Fixed Rate Countries
Percentages



Source: IMF, *International Financial Statistics*.

19 Other countries which have departed from the quasi-currency board rule – Guyana, Haiti, and Trinidad and Tobago – are not used in this comparison, because either economic structures or economic shocks differed significantly from those of the quasi-currency board countries.

20 While the currency board provides a highly visible certificate of good conduct for governments with conservative budget strategies, it is not a substitute for, nor a guarantee of, fiscal discipline. Recent Argentine experience is only the most recent reminder that fiscal discipline is a requirement for stable exchange rates in the open economy, irrespective of the exchange rate.

In a fully dollarised economy there is no yardstick for measuring the efficiency of fiscal policy which gives as timely and unambiguous a signal of the need for corrective action. There is a need for measures of fiscal performance which are sufficiently prominent in the public mind – as is the rate of inflation in the popular targeting framework – that expected deviations from the target will attract public sanction and induce government to take corrective action before macroeconomic disequilibrium becomes acute. Under the quasi-currency board regime the level of foreign reserves in relation to central bank liabilities and foreign obligations, the two benchmarks that define the currency board, perform the tracking function and give early warning of the need for policy adjustment.

IV. A CURRENCY UNION FOR THE CARIBBEAN

A. The Case for a Single Investment Market

The adoption of currency board rules may be an essential step in achieving a currency union for CARICOM, and a vital element in the creation of a regional capital market of sufficient size for the development of internationally competitive firms. This capital market would be a single economic space where investors from all member countries would jointly conceive, plan, and implement investment projects in the activities in which the Caribbean has already demonstrated a comparative advantage – tourism, export agriculture and mineral production (and manufacturing, in the case of Trinidad and Tobago only) – and those service exports where there seems to be as yet unrealized potential – information services and entertainment.

The case for integration of the regional capital market lies with the gains from eliminating transactions costs, overcoming market distortions and barriers that inhibit cross-border investment within CARICOM and reducing overall levels of potential investment.[21] There are also potential dynamic gains from economies of scale, technology transfer, and learning by doing, in integrating the region more firmly in the U.S. dollar area, discussed in Burki, Perry, and Calvo (1997). In the most complete analysis of trade and development in Caricom countries to date, McIntyre (1995) concludes that Caricom should be constituted as a single economic space for the development of exports and competitive import substitutes.

For the most part, Caribbean enterprises are far too small to be competitive internationally. Of companies quoted on the stock exchanges of Barbados, Jamaica and Trinidad and Tobago, or traded over the counter elsewhere, only 21 had turnover in excess of US$100 million in their fiscal year 1999 (Medianet Ltd., 2000), although the largest mineral and tourism enterprises are not quoted. Of those 21, at least 15 operate in more than one CARICOM country. The average annual turnover of the three largest quoted Caribbean companies (US$480 million) is 3 percent of the average turnover of the three largest companies in Latin

---

21 See Robson (1993) for a survey and summary of theoretical and empirical research on the investment gains from regional integration.

America, as reported by the *Financial Times* "FT 500: The World's Largest Companies," May 11, 2001. (Latin America had three firms in the list of the largest 500).

A strategy of export diversification, to cushion the effects of adverse external shocks, is unlikely in the absence of strong indigenous firms of regional scope. Foreign investment has tended to follow well-trodden paths of demonstrated profitability, leading to concentration on single products or single markets by most foreign investors. Because information is costly, foreign investors are often not aware of potentially profitable investment opportunities in emerging sectors. Foreign investors are frequently unwilling to share product and market development costs on which they will not realize full or immediate returns, and they are sometimes unwilling to ride out downturns in the economic cycle. "The key to investment strategy is to get domestic entrepreneurs excited about the home economy. Encouraging foreign investment or liberalizing everything and then waiting for things to improve does not work." (Rodrik, 2002).

A regional capital market has begun to emerge, with indigenous firms that compete in extra-regional markets, and firms that compete effectively with international firms in the domestic market, having investments across Caribbean countries, in tourism, banking, insurance, and wholesale and retail services. However, in the absence of currency union, it remains small in relation to total investment in Caricom economies.

B. The Role of Currency Union

The cost of exchange rate uncertainty among regional currencies is a major barrier to unification of the Caricom investment market. A characteristic of Caricom currencies is that, unlike "core" currencies such as the U.S. dollar, the euro, the yen or sterling, private and public agencies in the issuing countries cannot borrow abroad in the domestic currency (Bordo and Flandreau, 2001). This remains true of Caricom member countries for borrowing among themselves. Although arrangements have been in place for cross-border transactions and quotations on the securities exchanges of Barbados, Jamaica, and Trinidad and Tobago for more than a decade, no major investment has been financed in this way, in the domestic currencies. Cross-border investment within Caricom, for example recent borrowings from Trinidad and Tobago banks by governments of eastern Caribbean countries, has been denominated in U.S. dollars.

---

22 Rose and van Wincoop (2001) estimate that, for a large number of countries (their sample includes The Bahamas and the ECCB member countries), the reduction of transactions costs as a result of currency union more than offsets any losses from surrendering monetary independence.

23 Seigniorage revenues might be distributed to the members of the monetary union in proportion to the liabilities of the central bank issued in each country, following the practice of the ECCB.

A common currency would eliminate these currency conversion costs and risks and would reduce transactions costs on products and services that are shared across the enterprise.[22] It would also add to the seigniorage revenue of the regional quasi-currency board, by replacing the U.S. dollar, the present common unit of account and vehicle for intra-regional settlement, with the Caribbean currency.[23] The introduction of a common currency, linked to the U.S. dollar via a regional quasi-currency board, would therefore be a landmark step in the development of the regional capital market – that is, the market for the funding of fixed investment – though other measures, notably the implementation of agreements for the free movement of persons, would be necessary to complement the capital market integration.

C. Potential Cost of Currency Union

The potential costs due to the diversion of trade within the currency union are trivial. As empirical studies have shown (Gondwe and Griffith, 1989; World Bank, 1990; Lewis-Bynoe and Webster, 2001), the potential for intraregional trade growth is minimal. The implication of the arguments developed in Section III is that the nominal exchange rate does not function as a shock absorber, since it has no expenditure switching effect. There is therefore no cost to giving up this tool.

The main cost of joining the currency union is political. Member countries which have maintained stable quasi-currency board regimes are reluctant to join a new regime, however carefully designed, simply because it is untried, in comparison with their own well-established track record. The incentive for them is their poor growth prospects under current arrangements, in an environment of increasing trade and financial liberalization. Countries that have maintained flexible regimes do not appear ready to make the long-term fiscal and structural commitments which adherence to a pegged rate regime would imply. However, the failure to make such a commitment continues to extract a severe penalty in terms of high interest rates, an uncertain climate for investment and low growth potential.

D. Fiscal Discipline, Financial Constraints, and Convergence

The issues of fiscal discipline and economic convergence among the members of the monetary union were fully explored in the design of the existing unconsummated arrangements for a Caricom monetary union. (Much of this background material appears in Farrell and Worrell, 1994.) Under these arrangements, fiscal discipline is achieved via an eligibility criterion for accession

---

24 The limit might be stated in terms of an equivalent debt/GDP ratio, given assumptions about long-term interest rates and average debt maturities, and how they might change over time. In principle, the limit might be derived from the solvency criterion, given a rate of time preference, the interest rate, and the rate of GDP growth, but in practice a rule of thumb must suffice.

to the monetary union, instrument independence for the central bank of the monetary union, and rules governing central bank lending to member governments, as follows:

- A sustainable external debt-service ratio, no higher than 15 percent of current account receipts, is one eligibility criterion for joining the monetary union.

- The central bank of the monetary union would have independence in the use of monetary instruments, including open market operations.

- The central bank will be constitutionally forbidden to lend to governments, except by way of securities issued on the open market.

These stipulations are sufficient, in an open economy in a world with well-informed international financial markets, to ensure fiscal discipline and eliminate pressure for money creation. An intuitive explanation is that government finance requirements, should they exceed the domestic supply of funds, will spill over into the foreign market, where government is constrained by solvency requirements. However, the international financial market is not always fully informed, and may continue to lend to governments for some time after they have exceeded prudent limits of borrowing; therefore, a stipulation is made on the external debt service ratio.[24] With open financial markets, a separate limit on domestic debt is redundant.

The combination of an exchange rate anchor and the above stipulations for fiscal discipline ensure convergence of inflation and interest rates, to levels prevailing in the United States. However, additional screening will be necessary of each potential member at the point of admission, to ensure there are no other sources of imbalance. Such a stipulation would be required with respect to Jamaica's accession to the monetary union under current circumstances. The Bank of Jamaica has kept the currency stable, maintained prudent fiscal balances, and contained external debt service, but has been forced to sell government securities at high real rates of interest, which cannot be sustained. In this case, the domestic financial requirement has not spilled over into the international financial market because of the high interest premium on domestic currency. The reduction of this premium would have to be a precondition for Jamaican accession to the monetary union.

Efficient and transparent financial regulation and supervision are essential for the credibility of the exchange rate peg. Financial institutions should be subject to prudential limits on their net open positions in foreign currencies, and limits on exposures *via* currency mismatches, in the prevailing climate of worldwide exchange rate volatility. Arrangements for government borrowing from financial institutions should be fully transparent, so that the price of credit responds to

---

25 "Decision of the Conference of the Heads of Government of the Caribbean Community on Caribbean Monetary Integration," Port of Spain, Trinidad and Tobago, July 1992, reproduced in Farrell and Worrell (1994), pp. 244–46.

any excessive demand for finance from government. In particular, there should be no directed credit, either for state-owned or private financial institutions.

Monetary union will not, of itself, promote convergence of output growth, employment growth, productivity growth, or a sustainable balance of external payments. The direct impact of monetary union on these variables is neutral, precisely because exchange rate policy is not an effective allocation tool for CARICOM countries. Henry and Downes (1994) found that there would be little immediate or short term effect on labour markets, and that the longer-term effects, while largely speculative, might well be positive. Fiscal policy could not be the same everywhere because of structural differences among Caricom members, most obviously in the case of Trinidad and Tobago, the group's only oil exporter. (Fiscal implications are discussed in Theodore, 1994).

The long-term viability of the monetary union is unaffected by potential divergences in the evolution of the equilibrium real exchange rates of members, precisely because there is little relation between the nominal value of the currency and the relative price – or cost of production – of tradables and nontradables. The equilibrium "real effective exchange rates," the most common measure of the "real" exchange rate, will converge, as the inflation rates of member countries converge on the U.S. inflation rate. Policies other than nominal exchange rate changes, for example labour market reforms and other structural policies, must be used to ensure convergence in the equilibrium paths of relative prices of tradables and non-tradables.

E. The Path to Currency Union

The member countries of the Caribbean Economic Community (Caricom) in 1992 signed an agreement for monetary union,[25] with the following criteria for accession to the union: the prospective member must have

- maintained an unchanged U.S. dollar value of its currency for at least 36 consecutive months;
- maintained a minimum of foreign exchange reserves equivalent to three months' of imports, for at least 12 consecutive months;
- recorded a ratio of external debt service to exports of goods and services of no more than 15 percent.

These criteria remain sufficient to assure a path towards Caribbean monetary union, with one exception: experience has proven the exchange rate criterion to be inadequate. The principal reason the agreement was not implemented was the devaluation of the Trinidad and Tobago dollar in 1995, after a little over three years when that currency's exchange rate had not changed. That experience indicated that, contrary to the implicit assumption underlying the agreed CARICOM criterion, three years of an unchanged exchange rate, even when backed with reserve cover above the stipulated limit and a moderate external debt service ratio, was not enough to reduce the expected exchange rate change to zero.

The currency board rule offers an alternative, and effective, means of reducing expected exchange rate changes to zero during the transition to the currency union. The recommendation of this paper, therefore, is that the agreed criteria for CARICOM monetary union should be supplemented by the requirement that potential members commit to the currency board rule.[26] For additional credibility in the foundation years of the monetary union, the currency board requirement could be a strict one – involving a minimum of 100 percent foreign exchange cover of domestic liabilities – for any country that has recorded an exchange rate change in the past decade.

Summary

From a theoretical point of view, changes in the exchange rates of small, very open economies do not result in switches in expenditure, towards production for export and consumption of import substitutes, and they either have no effect on financial inflows and outflows (if the exchange rate change is anticipated) or they precipitate capital flight (in cases of unanticipated devaluation). These theoretical considerations, as well as experience over the past three decades, indicate that a fixed exchange rate regime is preferable for CARICOM countries. The experiences of Caribbean countries show that exchange rate depreciation is inflationary, and that, while changes in the relative prices of tradables may affect exports, tourism, and imports, nominal exchange rate changes have no predictable effect on those relative prices.

A quasi-currency board, which ensures the stability of the exchange rate by maintaining a supply of foreign exchange reserves for its defence, is the only regimen that has produced a sustainable fixed exchange rate in the CARICOM region. It has advantages over full dollarisation: some seigniorage accrues to the domestic monetary economy, the monetary authority may act as a lender of last resort for domestic banks, and a commitment to a fixed exchange rate lends credibility to appropriate fiscal policies.

The CARICOM region has as an objective a single market for investment, to achieve the scale and capture the synergies needed to produce internationally competitive firms. A common currency is potentially a vital pillar in the unification of the Caribbean investment market. It may be achieved, under the conditions already agreed on by CARICOM heads of government, if all members commit to currency board regimes before acceding to the union.

---

26 Of the countries that do not currently operate on quasi-currency board rules, the bank of Guyana holds foreign assets equivalent to 180 percent of base money, and the corresponding ratios are, for Haiti 45 percent, for Jamaica 97 percent, for Suriname 90 percent, and for Trinidad and Tobago 193 percent. Haiti would therefore be the only country facing a difficulty in meeting the currency board requirement. However, it may be argued that Jamaica's foreign reserves are boosted by high real domestic interest rates.

References

Anthony, Myrvin, and Andrew Hughes Hallett. 1999. "Is the Case for Economic and Monetary Union in the Caribbean Realistic?" (Glasgow: University of Strathclyde)

Argy, Victor and, Paul De Grauwe, eds., 1990. *Choosing an Exchange Rate Regime: the Challenge for Smaller Industrial Countries* (Washington: International Monetary Fund).

Arize, A. C., 1996. "The Impact of Exchange-Rate Uncertainty on Export Growth: Evidence from Korean Data," *International Economic Journal,* Vol. 10, No. 3 (Autumn), pp. 49–60.

Baliño, Tomás and others, 1997. *Currency Board Arrangements: Issues and Experiences*, IMF Occasional Paper No. 151 (Washington: International Monetary Fund).

Böhm, Hjalmar and Michael Funke. 2001. "Does the Nominal Exchange Rate Regime Matter for Investment?" (Hamburg: Hamburg University Working Paper, August).

Burki, Shahid, Guillermo Perry, and Sara Calvo, eds., 1998. *Trade: Towards Open Regionalism,* World Bank Conference on Development in Latin America and the Caribbean 1997 (Washington: World Bank).

Bynoe-Mayers, Nola. 1997. "Measuring the Real Exchange Rate Using GDP Deflators" *Central Bank of Barbados Economic Review* (June).

Calvo, Guillermo, and Carmen Reinhart, "Fear of Floating," University of Maryland and NBER, www.bsos.umd.edu/econ/ciecrp11.pdf (September).

Calvo, G., and C. Vegh. 1995. "Fighting Inflation with High Interest Rates: the Small Open Economy Case Under Flexible Prices," *Journal of Money Credit and Banking,* Vol. 27, No. 1 (February).

Carter, Adrian. 1997. "Economic Size, Openness and Export Diversification: A Statistical Analysis," *Central Bank of Barbados Economic Review* (December).

Clarke, Laurence, and Donna Danns, eds., 1997. *The Financial Evolution of the Caribbean Community 1970–96* (Port-of-Spain: Caribbean Centre for Monetary Studies).

Clarke, Carl, Celeste Wood, and DeLisle Worrell. 1986. "Prices, Incomes and the Growth of Tourism in Barbados, 1956-83," *Central Bank of Barbados Economic Review,* Vol. XIII, No.1 (June).

Coppin, Addington. 1993. "Recent Evidence on the Determinants of Inflation in a Tourism-oriented Economy: Barbados," *Social and Economic Studies*, Vol. 42, No. 2–3, pp. 65–80.

Cumberbatch, Cheryl Ann. 1997. "A model of inflation in Barbados," in Worrell, DeLisle and Roland Craigwell, *Macroeconomics and Finance in the Caribbean: Quantitative Analyses* (Port-of-Spain: Caribbean Centre for Monetary Studies).

Dornbusch, Rudiger. 2001. "Fewer Monies, Better Monies, 2110, " *American Economic Review*, Papers and Proceedings, Vol. 21 (May), pp. 238-42.

Downes, A., C. Holder and H. Leon. 1990. "The Wage-price-productivity Relationship in a Small Developing Country: The Case of Barbados," *Social and Economic Studies* (June).

Eichengreen, Barry and others, 1998. *Exit Strategies: Policy Options for Countries Seeking Greater Exchange Rate Flexibility*, IMF Occasional Paper No. 168 (Washington: International Monetary Fund).

Farrell, Terence, and DeLisle Worrell. 1994. *Caribbean Monetary Integration* (Port-of-Spain: Caribbean Information Systems and Services).

Frankel, Jeffrey. 1999. "No Single Currency Regime is Right for all Countries or at all Time," Princeton Essay in International Finance (August).

Gondwe, Derrick, and Winston Griffith. 1989. "Trade Creation and Trade Diversion: A Case Study of MDCs in CARIFTA," *Social and Economic Studies*, Vol. 38, No. 3 (September).

Harris, Donald, 1994, "Determinants of Aggregate Export Performance in Caribbean Countries," (un-published, Stanford, California: Stanford University, Department of Economics, September).

Hausmann, Ricardo, Michael Gavin, C. Pages-Serra, and Ernesto Stein. 1999. "Financial Turmoil and the Choice of Exchange Rate Regime," seminar paper presented at the IDB Annual Meeting, March.

Henry, Ralph, and Andrew Downes. 1994. "Labor Market Issues in Caribbean Monetary Union," in Farrell, Terence and DeLisle Worrell, *Caribbean Monetary Integration* (Port-of-Spain: Caribbean Information Systems and Services).

Holder, Carlos, and DeLisle Worrell. 1985. "A Model of Price Formation for Small Economies: Three Caribbean Examples," *Journal of Development Economics*, Vol. 18, pp. 411–28.

International Monetary Fund. 1997. *World Economic Outlook*, October 1997 (Washington: International Monetary Fund).

Isard, Peter, and Hamid Faruqee, eds., 1998. *Exchange Rate Assessment: Extensions of the Macroeconomic Balance Approach,* IMF Occasional Paper No. 167 (Washington: International Monetary Fund).

Lattie, Claney. 2000. "Defining and Estimating a Monetary Conditions Index for Jamaica," in Maurin, Alain and Patrick Watson, eds., *Empirical Studies in Caribbean Economy,* Caribbean Centre for Monetary Studies.

Lewis, Arthur. 1972. "Statement at the Second Annual Meeting of the Board of Governors of the Caribbean Development Bank".

Lewis-Bynoe, Denny, and Allan Webster. 2001. "International Trade and Comparative Advantage in the Caribbean," *Journal of Eastern Caribbean Affairs,* Vol. 20, No. 4 (December).

Marsh, Ian, and S. Tokarick. 1994. "Competitiveness Indicators: A Theoretical and Empirical Assessment," IMF Working Paper (Washington: International Monetary Fund).

Masters, William, and Elena Ianchovichina. 1998. "Measuring Exchange Rate Misalignment: Inflation Differentials and Domestic Relative Prices," *World Development,* Vol. 26, No. 33 (March) pp. 465–77.

McIntyre, Arnold. 1995. *Trade and Economic Development in Small Open Economies: The Case of the Caribbean Countries* (New York: Praeger Publishers).

Medianet Ltd., 2000. "The Caribbean's Top 100 Companies," Port-of-Spain, Trinidad.

Pindyck, Robert. 1991. "Irreversibility, Uncertainty, and Investment," *Journal of Economic Literature,* Vol. XXIX, No.3 (September).

Poon, Auliana, 1993, *Tourism, Technology and Competitive Strategies,* Wallingford, UK: CAB International.

Reinhart, Carmen, and Vincent Reinhart. 2001. "What Hurts Most? G-3 Exchange Rates or Interest Rate Volatility?" NBER Working Paper (Cambridge, Massachusetts: NBER, October).

Robson, Peter. 1993. "The New Regionalism and Developing Countries," *Journal of Common Market Studies,* Vol. 31, No. 3 (September).

Rodrik, Dani. 2002. "Find Option to Neoliberalism or Seek to Prevent its Abuse," *Jakarta Post,* October 1.

Rose, Andrew, and Eric van Wincoop. 2001. "National Money as a Barrier to International Trade: The Real Case for Currency Union," *American Economic Review,* Vol. 91, No. 2 (May) pp. 386–90.

Rosensweig, Jeffrey. 1988. "Elasticities of Substitution in Caribbean Tourism," *Journal of Development Economics*, Vol. 29, No. 1 (July) pp. 89–100.

Theodore, Karl. 1994. "Fiscal Issues in Caribbean Monetary Integration," in Farrell, Terence and DeLisle Worrell, *Caribbean Monetary Integration* (Port-of-Spain: Caribbean Information Systems and Services).

Watson, P. K., and S. Teelucksingh, 2000, "Policy Making and Forecasting in Trinidad and Tobago: Using a Medium-size Structural Econometric Model," in Maurin, Alain and Patrick Watson, Editors, *Empirical Studies in Caribbean Economy* (Port-of-Spain: Caribbean Centre for Monetary Studies).

_____. 1997. "Macroeconomic Modelling and Co-integration in a Small Sampling Framework (with Application to Trinidad and Tobago," in Worrell, DeLisle and Roland Craigwell, Editors, *Macro-economics and Finance in the Caribbean: Quantitative Analyses* (Port-of-Spain: Caribbean Centre for Monetary Studies).

Whitehall, P. and K. Greenidge. 2000. "Tourism Maturity and Demand," in Maurin, Alain and Patrick Watson, Editors, *Empirical Studies in Caribbean Economy* (Port-of-Spain: Caribbean Centre for Monetary Studies).

World Bank. 1990. "The Caribbean Common Market: Trade Policies and Regional Integration in the 1990s," (unpublished, Washington: December).

Worrell, DeLisle, 1987, *Small Island Economies: Structure and Performance in the English Speaking Caribbean since 1970* (New York: Praeger Publishers).

_____. 1992. *Economic Policies in Small Open Economies: Prospects for the Caribbean*, Commonwealth Economic Papers No. 23 (London: The Commonwealth Secretariat).

_____. 1993. "Economic Integration with Unequal Partners: the Caribbean and North America," Working Paper (Washington: Woodrow Wilson Center for International Scholars, December).

_____. 1996. "Monetary Policy in Small Open Economies," *Central Bank of Barbados Economic Review* (September).

_____. 2000. "Monetary and Fiscal Coordination in Small Open Economies," IMF WP/00/56 (Washington: International Monetary Fund).

_____. Daniel Boamah, and Trevor Campbell. 1996. "The Price Competitiveness of Barbados' Exports," *Central Bank of Barbados Economic Review* (June), pp.12–32.

_____. Don Marshall, and Nicole Smith. 2000. "The Political Economy of Exchange Rate Policy in the Caribbean," Working Paper (Washington: Inter-American Development Bank, June).

15

Modelling Exchange Rate Pass-Through and Inflation in Trinidad and Tobago[1]

Janice Christopher-Nicholls &
Leslie Ann DeVignes

I. Introduction

In the theoretical literature, the degree to which changes in the exchange rate pass through to prices has been an important issue in debates about the appropriateness of monetary policy and exchange rate policy. Its relevance is manifested even more with the emergence of a greater role for inflation rate targeting. A low exchange rate pass-through presents greater freedom for the pursuit of independent monetary policy and an easier implementation of inflation rate targeting. However, there is little or no consensus on the conditions that lead to a low exchange rate pass-through.

Studies by Mann (1986), Wei and Parsley (1995) and Engel and Rogers (1998), which explored the pass-through of exchange rate changes to prices, argued that greater exchange rate volatility may reduce exchange rate pass through to prices since importers may be more willing to adjust profit margins rather than prices. However, they suggest that the response would most likely be different, if firms believed that the exchange rate shock is persistent. Their action would be an adjustment to prices rather than profit margins. These studies also examined the role of aggregate demand and suggested that shifts in aggregate demand together with fluctuations in the exchange rate would alter the profit margins of importers, therefore lowering the pass-through. Hence, exchange rate pass-through should be smaller in a country where aggregate demand is of a more volatile nature.

Kim (1998) presented the argument that while the money supply, income and interest rates affected US inflation directly, the exchange rate, on the other hand, influenced the aggregate price by changing the prices of importables and

---

1 The views expressed in this paper are those of the authors and in no way represent the views of the Central Bank of Trinidad and Tobago. Any errors or misconceptions are the responsibility of the authors.

exportables. He contended that the nature of the good dictated the changes in the dollar price of imports. He argued that for homogeneous commodities traded in international markets, a depreciation of the US dollar would increase their prices one on one because of the law of one price. In the case of manufactured goods, however, foreign suppliers to the domestic US market absorb some of the impact of the exchange rate changes and the price will rise by less than the US dollar depreciation. Kim concluded that as long as import prices increase, there would be matching hikes by domestic manufacturers and the extent to which prices of intermediate goods are affected by exchange rate movements would be reflected in cost increases that will be passed on.

In a more recent paper by Taylor (2000), it was argued that firms set prices for several periods ahead and those prices respond more to increases in costs (due to exchange rate depreciation or other sources) if these cost changes are viewed to be persistent. Taylor articulated the view that a high inflation environment would tend to increase the exchange rate pass-through while a credible low inflation regime would automatically achieve a low pass-through. Two recent studies by Campa and Goldberg (2001) and Ganon and Ihrig (2001) explored the relationship of exchange rate pass-through with monetary policy behaviour and the inflationary environment. The evidence from these studies, though not conclusive, seemed to suggest a positive relationship between higher inflation and exchange rate volatility but argued that the composition of imports was an important determinant of the pass-through effect.

The main objective of this paper is to re-examine, using the VAR modelling approach, the relationship between inflation and many of the factors that are known to contribute to inflationary trends in Trinidad and Tobago. The paper also carries out a preliminary investigation of the pass-through of exchange rate to domestic prices. This research follows on the work of Robinson (1998) who examined price behaviour in Jamaica using a VAR model. Robinson found that whereas a decline in the rate of depreciation of the exchange rate had an immediate dampening effect on prices, particularly in the first year, contractionary monetary policy had a lag effect of at least two months. Based on his results, Robinson contended that inflationary shocks were long-lived in Jamaica and that stabilization policies must take significant recognition of this fact. Explanations of inflationary trends in Trinidad and Tobago have been explored in many research papers and one of the contributions of this paper would be to test, using Granger causality, the transmission mechanism between exchange rate, import prices and consumer prices. The argument is that movements in the exchange rate should inevitably affect consumer prices in a small open economy such as Trinidad and Tobago. A change in the exchange rate is transmitted directly to prices or indirectly through changes in the composition of demand or the levels of aggregate demand. Evidently, a depreciation of the local currency would affect the prices of imported goods; however, the increased cost to producers and retailers would not be reflected entirely or immediately on consumer prices. The extent and the speed of the pass-through would depend on factors such as demand conditions, the cost of adjusting prices and the perception of the duration of the depreciation. However, it must be emphasized that in Trinidad and Tobago, as in many other economies, inflation depends ultimately on monetary policy which in turn influences exchange rate fluctuations.

The paper is organized as follows. Section II presents a description of Trinidad and Tobago's inflationary experience while Section III provides a brief review of the empirical studies of inflation for Trinidad and Tobago. Section IV outlines the VAR model and presents an empirical analysis of the time series data. Section V discusses the results and interpretation of the impulse response and the variance decomposition. Section VI provides a conclusion.

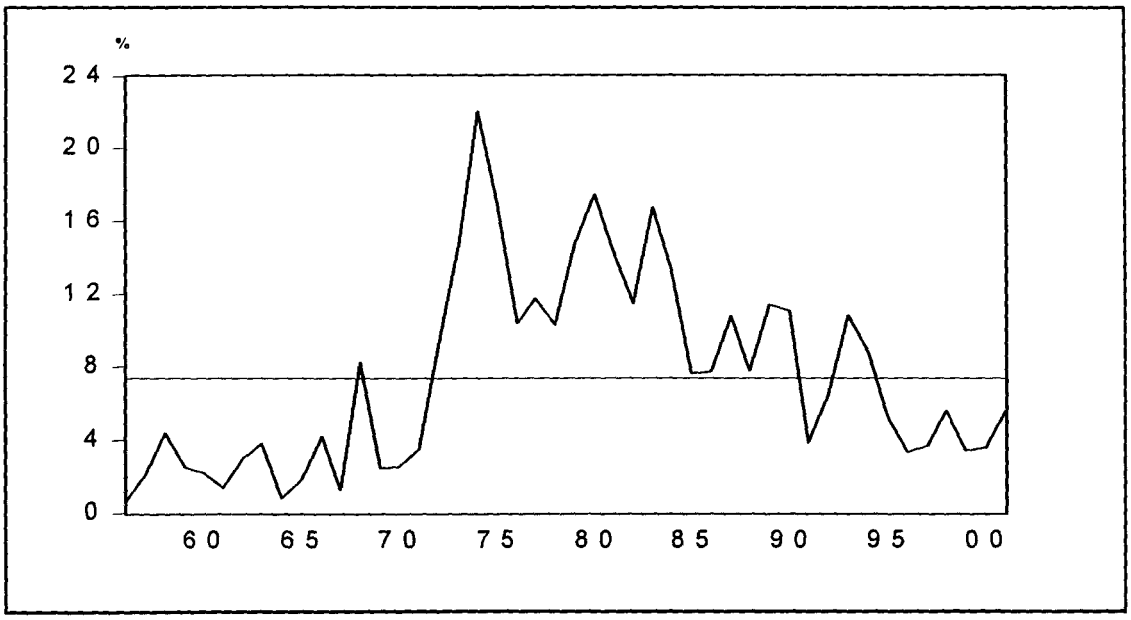
II. Trinidad and Tobago's Inflationary Experience

Trinidad and Tobago experienced low inflation over the period 1955 to 1971 with an average inflation rate of 2.8 per cent. During this period, the TT dollar was pegged to the pound sterling and monetary policy was influenced by movement in the interest rates of the United Kingdom. In 1967, the pound sterling came under immense pressure and was devalued by 14.3 per cent. In order to maintain its parity with the pound sterling the TT dollar was subsequently devalued by the same amount. Consequently, in 1968 the first inflationary episode occurred as the inflation rate increased by 8.3 per cent. However, this spurt of inflation was short-lived as the rate declined to 2.4 per cent in 1969 and remained around this level until 1972.

The second surge of inflation occurred over the period 1972 to 1983 and was more pervasive than in 1968. Inflation rose from 3.5 per cent in 1971 to 9.3 per cent in 1972, to 14.8 per cent in 1973 and reached a high of 22 per cent in 1974. A combination of factors contributed to the fuelling of inflation over this period. The oil boom, which aggravated the excess liquidity situation in the banking system, caused an expansionary effect on the money supply. Moreover, import prices were higher, supply conditions were more constrained because of the severe drought of 1973 and there was also wage price inflation. Inflation slowed somewhat after 1975 and by the end of 1983 the inflation rate was 16.7 per cent.

Following the decline in the economy in 1983, the country entered a period of extended structural adjustment from 1984 to 1993. During this period, inflation slowed due to the implementation of tighter monetary and fiscal policies, and the recession in Trinidad and Tobago. Monetary policy was now concerned with protection and stabilization of the balance of payments and shifted emphasis away from inflation control. Consequently, there was a 33 per cent devaluation of the TT dollar against the United States dollar in December 1985. However, the pass-through to domestic prices was not immediate, since the old exchange rate was maintained for a scheduled list of food, drugs, and other imported items. By 1987, however, with the unification of the exchange rate, inflation reached 10.7 per cent. The TT dollar was devalued again in 1988 and by 1989 the country entered into back-to-back stand-by arrangements with the IMF. These arrangements sought to reduce the external account deficit, lower the fiscal deficit, achieve an accumulation of foreign exchange reserves and restore economic growth. All these developments culminated in the floating of the TT dollar in 1993 and the removal of exchange controls. This resulted in an immediate 25.1 per cent devaluation of the TT dollar and the one time pass-through to domestic prices was reflected in an inflation rate of 10.8 per cent.

Chart 1: Inflationary Episodes



More recent trends have indicated that inflation has slowed considerably, averaging 4.3 per cent over the period 1994 to 2001. These seven years were characterized by non-inflationary growth, relatively low unemployment rate, balance of payments surpluses and high and increasing foreign reserves. In Trinidad and Tobago the low level of inflation can also be attributed to factors such as low world inflation, the relatively tight stance of monetary policy and the fact that government continued to practise fiscal restraint.

III. Empirical Studies of Inflation in Trinidad and Tobago

This section concentrates on empirical research of the inflationary process in Trinidad and Tobago. As discussed in Section II, the 1970s and 1980s were years of double-digit inflation compared with the low inflation levels of the 1960s, and many research papers emerged to explain these inflationary trends. It was generally recognized that higher prices were due both to international and domestic developments. The focus therefore was on (i) the mechanisms through which international inflation pressures were transmitted to the Caribbean region, (ii) domestic supply conditions such as inelastic supply of key commodities and high markups.[2]

2 The Structuralist interpretation is well discussed in Seers (1962).

The two earliest studies, St. Cyr (1974) and Ramjeesingh (1974), were clearly rooted in the Structuralist school as both studies explored factors such as the degree of openness of the economy, wages and earnings and import prices. The results of these studies concluded that changes in import prices played the key role in explaining domestic price movements. Indeed, Ramjeesingh's research also looked at the demand-supply mechanism to explain the determinants of price change and found demand side influences were unimportant. These results further entrenched the Structuralist tradition as the explanatory approach to Trinidad and Tobago's inflation.

In the aftermath of the first oil price shock of 1974 and the ensuing inflation and recession in the international community, regional monetary authorities adopted a more active monetary stance. As a consequence, empirical research shifted its focus to the investigation of the influence of monetary factors on inflationary trends. The model specified by Bourne and Persaud (1977) and St. Cyr (1979) incorporated both demand–pull and cost-push factors to explain the propulsive role of monetary and financial variables.[3] In particular, St. Cyr tested the hypothesis that import prices triggered price increases and increases in wages and salaries and that the money supply performed a permissive role while price expectations reinforced the spiral.

By the 1980s, following the "hybrid" models, Bynoe (1981) explicitly researched the monetarist approach to the balance of payments to examine the inflationary process, modifying this approach to include the role of fiscal policy. She suggested that while import prices were important, there was also an explanatory role for fiscal activity, income and monetary variables. Farrell (1984) assumed that sources of inflation vary over time and that they affected the inflationary process in different ways. The results of this research showed that changes in the exchange rate were statistically significant while import prices were not.

Empirical research on the determinants of inflation in the 1990s for Trinidad and Tobago has been less vigorous while our regional counterparts such as Coppin (1993), Robinson (1998), Cumberbatch (1997) and Allen (2000) have continued to explore the inflationary process in Barbados and Jamaica. Meanwhile the inflationary process in Trinidad and Tobago was investigated in the 1990s by Christopher-Nicholls (1992) who adopted the Johansen's procedure to analyse the inflation trends from 1955 to 1990 and found import prices to be important. Nicholls et al (1995) explored money price causation in four CARICOM countries and Agbeyegbe (1996) and Leon *et. al.* (1996) estimated the stochastic nature of inflation and inflation convergence for Trinidad and Tobago. Since then, the emphasis on empirical research has shifted to the measurement of core inflation and an examination of an inflation rate-targeting framework for Trinidad and Tobago. Even though the TT dollar was floated in 1993, there has been no significant research on the impact of exchange rate movements on inflation. Stanley (1996) attempted to measure core and underlying inflation using the zero weighting technique to exclude non-monetary factors from the series of

---

3 These models have been described as "hybrid" models as articulated by Harberger (1963).

retail prices index. In one representation he isolated food price fluctuations to obtain a core measure of inflation. Meanwhile Rambarran (2000), on the basis of some preliminary research, concluded that if Trinidad and Tobago were to adopt an inflation rate targeting, it would be a means by which it could maintain its inflation gains. The evidence suggested that Trinidad and Tobago had already achieved some degree of success in controlling inflation.

IV. A VAR Model and Empirical Analysis

VAR Model[4]

The modelling approach used to examine the relationship between inflation and its determinants is a vector autoregression (VAR) model.[5] In essence the approach involves a model of the moving average and autoregressive components of several time series variables which are then used to predict movements in these variables. The econometric literature clearly highlights the usefulness of this approach for forecasting systems since it provides for the causal and feedback relation among time series variables. VAR modelling has been used extensively in the pass-through literature to simulate the dynamic response over time of any variable to disturbances of itself or to other variables in the system.

Consider the following VAR model used to explain the inflationary process in Trinidad and Tobago:

$$\dot{p}_t^d = \alpha_{10} + a_{10}\dot{R}_{1t} + a_{11p}P_{1t}^o + \sum_{i=1}^{n} b_{1i}\dot{p}_{t-i}^d + \sum_{i=1}^{n} c_{1i}\dot{y}_{t-i} + \sum_{i=1}^{n} d_{1i}\dot{p}_{t-i}^m + \sum_{i=1}^{n} e_{1i}\dot{M}_{t-i}^0 + \sum_{i=1}^{n} f_{1i}\dot{p}_{t-i}^e + \mu_{1t}^{p_t^d}$$

$$\dot{y}_t = \alpha_{20} + a_{20}\dot{R}_{2t} + a_{21}\dot{P}_{2t}^o + \sum_{i=1}^{n} b_{2i}\dot{p}_{t-i}^d + \sum_{i=1}^{n} c_{2i}\dot{y}_{t-i} + \sum_{i=1}^{n} d_{2i}\dot{p}_{t-i}^m + \sum_{i=1}^{n} e_{2i}\dot{M}_{t-i}^0 + \sum_{i=1}^{n} f_{2i}\dot{p}_{t-i}^e + \mu_{2t}^{y_t}$$

$$\dot{p}_t^m = \alpha_{30} + a_{30}\dot{R}_{3t} + a_{31}\dot{P}_{3t}^o + \sum_{i=1}^{n} b_{3i}\dot{p}_{t-i}^d + \sum_{i=1}^{n} c_{3i}\dot{y}_{t-i} + \sum_{i=1}^{n} d_{3i}\dot{p}_{t-i}^m + \sum_{i=1}^{n} e_{3i}\dot{M}_{t-i}^0 + \sum_{i=1}^{n} f_{3i}\dot{p}_{t-i}^e + \mu_{3t}^{p_t^m}$$

$$\dot{M}_t^0 = \alpha_{40} + a_{40}\dot{R}_{4t} + a_{41}\dot{P}_{4t}^o + \sum_{i=1}^{n} b_{4i}\dot{p}_{t-i}^d + \sum_{i=1}^{n} c_{4i}\dot{y}_{t-i} + \sum_{i=1}^{n} d_{4i}\dot{p}_{t-i}^m + \sum_{i=1}^{n} e_{4i}\dot{M}_{t-i}^0 + \sum_{i=1}^{n} f_{4i}\dot{p}_{t-i}^e + \mu_{4t}^{m_t^2}$$

$$\dot{p}_t^e = \alpha_{50} + a_{50}\dot{R}_{5t} + a_{51p}\dot{P}_{5t}^o + \sum_{i=1}^{n} b_{5i}\dot{p}_{t-i}^d + \sum_{i=1}^{n} c_{5i}\dot{y}_{t-i} + \sum_{i=1}^{n} d_{5i}\dot{p}_{t-i}^m + \sum_{i=1}^{n} e_{5i}\dot{M}_{t-i}^0 + \sum_{i=1}^{n} f_{5i}\dot{p}_{t-i}^e + \mu_{5t}^{p_t^d}$$

where,

$\dot{p}_t^d$ = changes in domestic prices

$\dot{y}_t$ = changes in Gross Domestic Product (GDP)

---

4 See Watson and Teelucksingh (2002) for a introductory discussion of VAR modelling.

5 VAR models were developed by Sims (1980) who challenged the validity the theoretical restrictions of the traditional structural form models.

$\dot{p}_t^m$ = changes in import prices

$\dot{M}_t^0$ = changes in base money

$\dot{p}_t^e$ = changes in exchange rate

$\dot{R}_{it}$ = changes in Treasury bill rate

$\dot{P}_{it}^o$ = changes in oil prices

In Matrix format the model is as follows:-

$$\begin{bmatrix} \dot{p}_t^d \\ \dot{y}_t \\ \dot{p}_t^m \\ \dot{M}_t^0 \\ \dot{P}_t^e \end{bmatrix} = \begin{bmatrix} b_{11}\, c_{11}\, d_{11}\, e_{11}\, f_{11} \\ b_{21}\, c_{21}\, d_{21}\, e_{21}\, f_{21} \\ b_{31}\, c_{31}\, d_{31}\, e_{31}\, f_{31} \\ b_{41}\, c_{41}\, d_{41}\, e_{41}\, f_{41} \\ b_{51}\, c_{51}\, d_{51}\, e_{51}\, f_{51} \end{bmatrix} \begin{bmatrix} \dot{p}_{t-1}^d \\ \dot{y}_{t-1} \\ \dot{p}_{t-1}^m \\ \dot{M}_{t-1}^0 \\ \dot{P}_{t-1}^e \end{bmatrix} + \begin{bmatrix} b_{12}\, c_{12}\, d_{12}\, e_{12}\, f_{12} \\ b_{22}\, c_{22}\, d_{22}\, e_{22}\, f_{22} \\ b_{32}\, c_{32}\, d_{32}\, e_{32}\, f_{32} \\ b_{42}\, c_{42}\, d_{42}\, e_{42}\, f_{42} \\ b_{52}\, c_{52}\, d_{52}\, e_{52}\, f_{52} \end{bmatrix} \begin{bmatrix} \dot{p}_{t-2}^d \\ \dot{y}_{t-2} \\ \dot{p}_{t-2}^m \\ \dot{M}_{t-2}^0 \\ \dot{P}_{t-2}^e \end{bmatrix} + \begin{bmatrix} b_{13}\, c_{13}\, d_{13}\, e_{13}\, f_{13} \\ b_{23}\, c_{23}\, d_{23}\, e_{23}\, f_{23} \\ b_{33}\, c_{33}\, d_{33}\, e_{33}\, f_{33} \\ b_{43}\, c_{43}\, d_{43}\, e_{43}\, f_{43} \\ b_{53}\, c_{53}\, d_{53}\, e_{53}\, f_{53} \end{bmatrix}$$

$\tilde{y}_t \qquad B_1 \qquad \tilde{y}_{t-1} \qquad B_2 \qquad \tilde{y}_{t-2} \qquad B_3$

$$\begin{bmatrix} \dot{p}_{t-3}^d \\ \dot{y}_{t-3} \\ \dot{p}_{t-3}^m \\ \dot{M}_{t-3}^0 \\ \dot{P}_{t-3}^e \end{bmatrix} + \begin{bmatrix} b_{14}\, c_{14}\, d_{14}\, e_{14}\, f_{14} \\ b_{24}\, c_{24}\, d_{24}\, e_{24}\, f_{24} \\ b_{34}\, c_{34}\, d_{34}\, e_{34}\, f_{34} \\ b_{44}\, c_{44}\, d_{44}\, e_{44}\, f_{44} \\ b_{54}\, c_{54}\, d_{54}\, e_{54}\, f_{54} \end{bmatrix} \begin{bmatrix} \dot{p}_{t-4}^d \\ \dot{y}_{t-4} \\ \dot{p}_{t-4}^m \\ \dot{M}_{t-4}^0 \\ \dot{P}_{t-4}^e \end{bmatrix} + \begin{bmatrix} a_{10}\, a_{11} \\ a_{20}\, a_{21} \\ a_{30}\, a_{31} \\ a_{40}\, a_{41} \\ a_{50}\, a_{51} \end{bmatrix} \begin{bmatrix} \dot{R}_t \\ \dot{P}_t^o \end{bmatrix} + \begin{bmatrix} \alpha_{10} \\ \alpha_{20} \\ \alpha_{30} \\ \alpha_{40} \\ \alpha_{50} \end{bmatrix} + \begin{bmatrix} \mu_{1t}^{\dot{p}_t^d} \\ \mu_{2t}^{\dot{y}_t} \\ \mu_{3t}^{\dot{p}_t^m} \\ \mu_{4t}^{m_t^2} \\ \mu_{5t}^{\dot{p}_t^e} \end{bmatrix}$$

$\tilde{y}_{t-3} \qquad B_4 \qquad \tilde{y}_{t-4} \qquad A_1 \qquad Z_t \qquad A_0 \qquad E_t$

Simplified further the VAR model in matrix representation is as follows:-

$$\tilde{y}_t = A_0 + A_1 Z_t + B_1 \tilde{y}_{t-1} + \ldots + B_4 \tilde{y}_{t-4} + E_t$$

where $\tilde{y}$ is a vector of five endogenous variables, A_1 is a vector of two exogenous variables, B are matrices of coefficients to be estimated and E is a vector of random errors that are contemporaneously correlated with each other but uncorrelated with their own lagged values and uncorrelated with all the right hand side variables.

Empirical Analysis[6]

This section examines graphically the relationship between inflation and the percentage change in exchange rate, import prices, money supply and output. Chart 2 shows a strong relationship between movements in the exchange rates and inflation as the exchange rate shocks of 1967, 1976, 1985, 1988 and 1993 filtered through to domestic prices. Meanwhile, from Chart 3 we see that in the period 1971 to 1983, higher import prices brought on by accelerated world inflation had a positive influence on domestic price inflation. Moreover, Chart 4 shows that strong growth in base money over the period 1971 to 1983 coincided with the highest inflation rate in 1974. In terms of real output, between 1971 and 1983, the

Chart 2: Inflation(%) versus ER Depreciation(%)

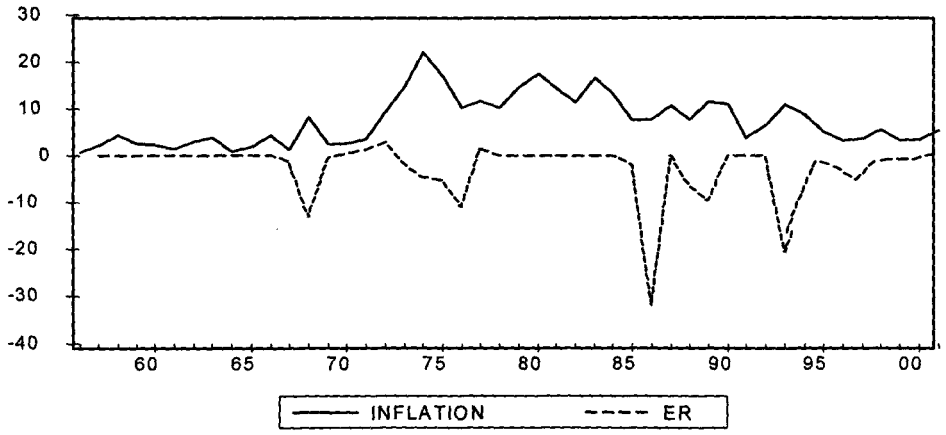
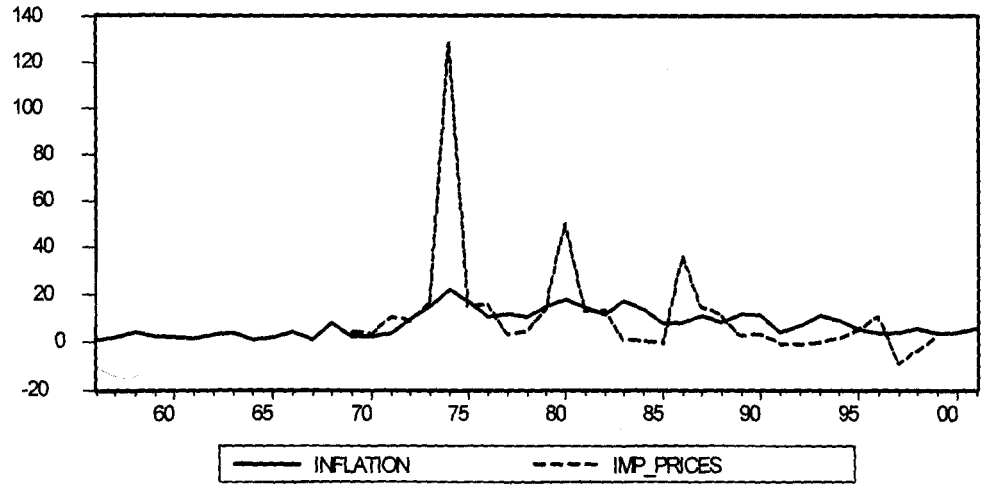


Chart 3: Inflation(%) Versus Import Prices(%)



6 See footnote 7.

Chart 4: Inflation(%) Versus M0(%)

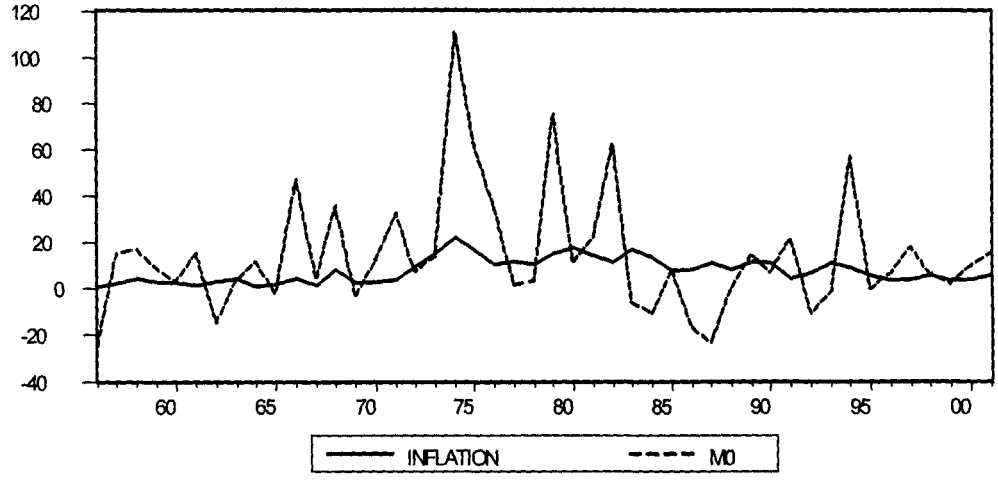
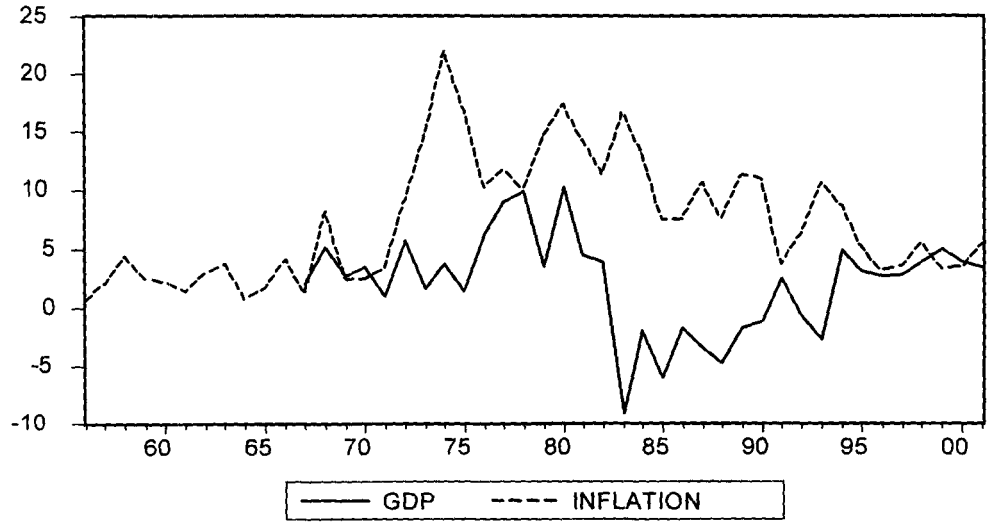


Chart 5: Inflation(%) Versus GDP(%)



economy grew at much slower rates compared with inflation, while negative growth between the years 1984 to 1993 corresponded with a slowing of the inflation rate. In more recent years *viz.* 1994 to 2001, both inflation and output have been trending in propinquity.

Variable Selection and Stationarity Test

The data used in the VAR model were quarterly, spanning the period 1982:1 to 2001:4. All the variables in the model with the exception of the Treasury bill rate are logarithmic transforms. The five endogenous variables are the Index of Retail Prices (RPI), the Index of Gross Domestic Product (GDP), base money (M0), the nominal effective exchange rate (TWNEER) and United States export prices

(USEXPR). The variable USEXPR was used as a proxy for import prices in the absence of an index of average unit value for imports and in light of the fact that the bulk of Trinidad and Tobago's imports are from the US. The exogenous variables are the Treasury bill rate and oil prices.[7]

Each of the variables above was then tested for stationarity using the Augmented Dickey-Fuller test and all the variables were found to be I(1) processes. The results are presented in Table 1.

Table 1. Augmented Dickey Fuller – Unit Roots Test Including Trend and Intercept

Variables	Level	First Difference
LRPI	-0.664052	-3.908691
LM0	-1.808989	-4.075151
LTWNEER	-2.410937	-3.959335
T_BILL_RATE	0.123678	-4.734156
LQGDPT	-1.518741	-4.129075
LUSEXPR	-2.205011	-3.529475
LAUVOILWTI	-3.257145	-4.634281

Mackinnon critical value for rejection of hypothesis of a unit root (5% critical value = -3.4696)

Lag Length Selection

The lag length for the endogenous variable in the unrestricted VAR model was based on the LR criterion, which selected an optimal lag-length of four.

Table 2. VAR Lag Order Selection Criteria

Lag	LogL	LR
0	245.6998	NA
1	899.5513	1182.307
2	919.0516	32.58954
3	930.4197	17.44148
4	957.9318	38.44158*
5	982.0548	30.40158
6	1010.239	31.65940
7	1026.517	16.05509

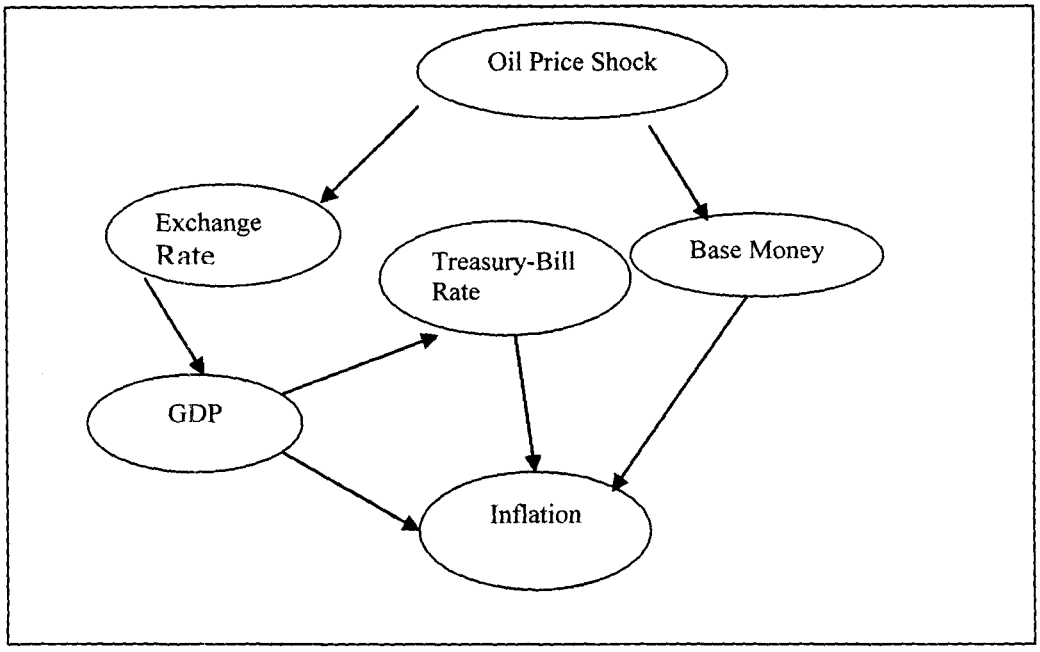
7 Data on exchange rate, inflation, Treasury bill rate, oil prices, quarterly GDP, nominal effective exchange rate and money supply were sourced from the Central Bank of Trinidad and Tobago Statistical publications, while the data on import prices (the index of US export prices) were sourced from the IFS. The software package used was EViews 4.0.

Granger Causality

To establish the transmission path between inflation and its determinants, the VAR pairwise Granger Causality test was performed. The results for the period 1982 to 2001 showed Granger causality (unidirectional) from base money, GDP and the Treasury bill rate to inflation. The oil price, which is exogenous in the VAR model, Granger caused (unidirectional) base money and the exchange rate (see Chart 6). It should be noted that in the case of Trinidad and Tobago, an oil price shock does not feed directly to inflation because of the subsidy imposed on oil products. Interestingly, there was no causality between import prices and inflation over the period and this may be attributable to the choice of the proxy for import prices. A more appropriate measure might have been the average unit value of imports. (See Appendix 1)

To examine whether these causal results varied in different time periods, the Granger test was applied to the individual periods 1982-1993 and 1994-2001. In the sub-period 1982-1993, oil price, import prices and exchange rate are found to Granger cause changes in base money which in turn causes inflation. In the sub-period 1994 to 2001 oil prices, import prices and GDP were found to cause exchange rate movements and oil prices, import prices and exchange rate Granger cause GDP. We can therefore identify feedback between GDP and the exchange rate and in turn a causal link between GDP, and inflation. In terms of base money, no causal link to inflation was observed during this period.

Chart 6: Granger Causality: 1982-2001



Cointegration Test and VECM

According to Engle and Granger (1987) a linear combination of two or more non-stationary series maybe stationary and if this is found to be the case the non-stationary time series are said to be cointegrated. The stationary linear combination is referred to as the cointegrated equation and is viewed as a long-run equilibrium relationship among the variables.

The Johansen cointegration procedure was used to test for cointegration of the non-stationary variables. Since five endogenous variables are present in the VAR model, at most four cointegrating equations could be expected. The results of the trace test based on an intercept and trend are displayed in Appendix 2. The trace test statistic confirmed that there was one cointegrating relation. The presence of this cointegrating relation means that the unrestricted VAR is not applicable and a vector error correction model (VECM) must be specified.[8] The VECM has a cointegration relation built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. The VECM was specified using one cointegrating equation, four lags of the differenced endogenous variables and the two exogenous variables (see Appendix 3). The Lagrange Multiplier test was carried out on the residuals of the VECM and revealed that there was no serial correlation present up to four lags. The estimated cointegrated equation is specified below as:

$$LRPI(-1) = 0.15LTWNEER(-1) + 0.08LM0(-1) - 0.86LQGDP(-1) + 0.29LUSEXPR(-1) + 0.02TREND + 5.09$$

The coefficients are all found to have the correct signs and are significant. All the variables have coefficients less than unity, which indicates that a shock to any of the variables will not completely pass through to inflation in the long run and there is no one- to- one transmission from shocked variable to inflation.

V. Results

Impulse Response Function and Variance Decomposition

The impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variable.[9] In other words, an impulse response function describes the response of an endogenous variable to a unit change in one of the innovations. Since the innovations are usually correlated, a transformation has to be applied to the innovations to make them uncorrelated so that the impulses could be interpreted.

---

8 The VECM is a restricted VAR designed for use with non-stationary series that are known to be conintegrated.

9 Eviews 4.0 User's Guide(2000): Quantitative Micro Software, LLC.

There are several options available for performing this transformation. The Cholesky decomposition, which is one of the most popular options, imposes an ordering of the variables in the VAR and ascribes all of the effect of any common component to the first variable in the VAR system. However, it must be highlighted that responses can change considerably if the ordering of the variables is changed. As a consequence, the generalized impulses which do not depend on the VAR ordering were used to generate the impulse response functions.. The following graphs show the response of inflation to a unit change in each of the other endogenous variables in the model.

A shock to the nominal exchange rate (TWNEER) (a depreciation in the value of the Trinidad and Tobago (TT) dollar), other things remaining constant, leads to only 0.15 per cent increase or pass through to domestic prices in the long run as seen in the equation above. From the graph (response of LRPI to TWNEER) it is observed that the effect of the shock is not felt until the fourth quarter when the price level begins to rise. The pass-through effect is slow with a speed of adjustment of 0.27 but persistent, and increases up to quarter 10 (two and half years) before diminishing somewhat. However, the inflation rate does not return to its original equilibrium but levels off at a new equilibrium. The initial decline in prices could be an indication that importers have inventories so that the exchange rate shock is not felt immediately. However, by the third quarter when inventories have been depleted, the effects of the shocks are then incorporated into the mark-ups on goods and services.

A shock to import prices (response of LRPI to LUSEXPR) impacts immediately on domestic prices and is also long-lived. A one-standard deviation increase in import prices leads to a steady rise in domestic inflation which grows to 1 per cent by quarter ten and then levels off at this rate to a new equilibrium level. These results are in keeping with cost-push theories which view the impact of import prices on production costs as filtering through to the pricing of final products and resulting in inflation. With respect to a unit increase in GDP, domestic prices decline and the price level converges to a new lower equilibrium.

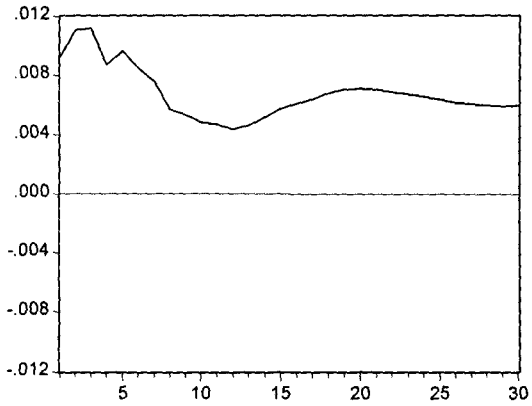
A price shock reflects the impact of expectations on inflation. If it is perceived that the price change would prevail, then firms would include their expectations in the mark-up of future prices. In contrast, if firms are optimistic that the price level would not change, then prices would not increase. The initial price shock represents a 0.9 per cent increase in the price level, the effects of which continue to be felt until the third quarter. However, by the fourth quarter (one year), expectations of price increases begin to weaken and the price level begins to decline. However, the initial shock is long-lived and prices gravitate to a new equilibrium level approximately 0.6 per cent above the pre-shock level.

Finally, a monetary shock to the system lead to a decline in the price level in the short run and to a new equilibrium level in the long-run. This result is contrary to the monetarist theory on inflation since an increase in the money supply is usually associated with a rising price level.

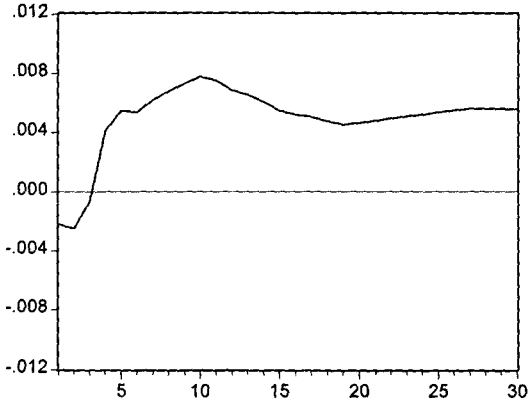
An analysis of the variance decomposition of inflation gives an indication of the relative importance of shocks of all the endogenous variables in the model. The variance decomposition of LRPI is highlighted below and indicates that the shocks of import prices, exchange rate and GDP are important in determining

Response to Generalized One S.D. Innovations

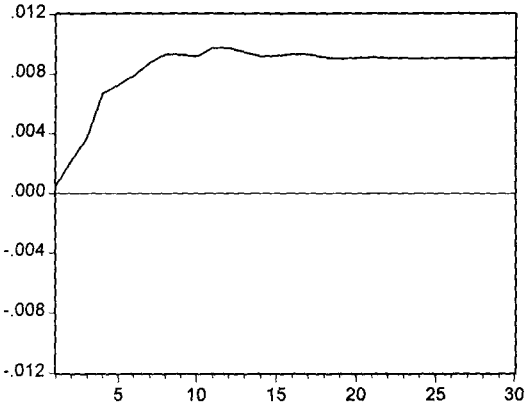
Response of LRPI to LRPI



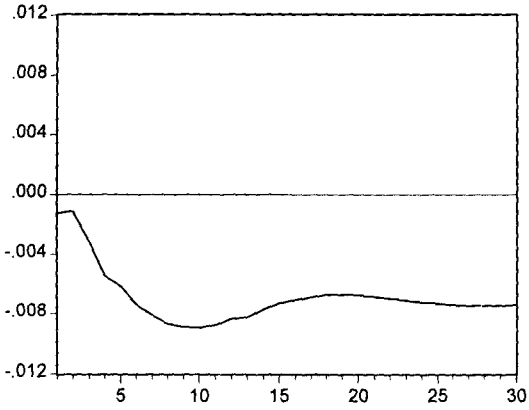
Response of LRPI to LTWNEER



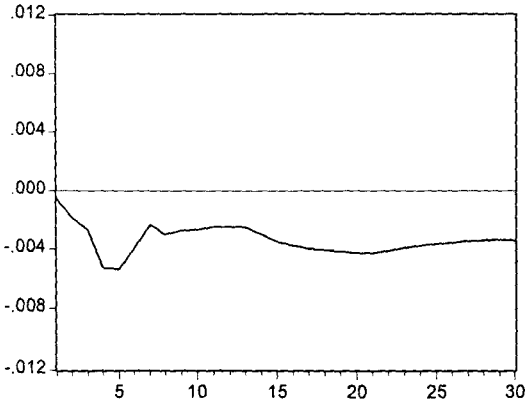
Response of LRPI to LUSEXPR



Response of LRPI to LQGDPT



Response of LRPI to LM0



the variability in inflation. The import price shock accounted for a significant proportion of the variation in domestic prices. The importance of import price shocks to variations in inflation increased over the time horizon, from 1.2 per cent in period two to 27.8 per cent by period 30. Table 3 (include):

Table 3. Variance Decomposition of LRPI

Period	S.E.	LRPI	LTWNEER	LM0	LQGDPT	LUSEXPR
1	0.009217	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.014529	98.15439	0.008089	0.611262	0.022443	1.203813
3	0.018833	93.40851	1.187174	1.508748	0.891624	3.003946
4	0.023340	74.67239	8.023304	5.317047	4.384831	7.602432
5	0.028118	63.20631	13.53793	6.764358	6.291010	10.20039
6	0.031935	56.11281	16.11669	6.489208	8.835261	12.44603
8	0.038769	44.06404	19.99189	5.198442	13.57668	17.16896
9	0.041842	39.45638	21.54352	4.838485	15.52213	18.63948
10	0.044726	35.68098	23.00687	4.560021	17.06324	19.68890
11	0.047438	32.67730	23.90799	4.301679	18.10644	21.00659
12	0.049790	30.42987	24.31199	4.132984	18.89881	22.22634
13	0.051953	28.73800	24.59679	3.998030	19.51687	23.15031
14	0.053928	27.59218	24.74856	3.979736	19.85594	23.82359
15	0.055790	26.83644	24.68037	4.062439	19.98829	24.43247
16	0.057598	26.28062	24.53978	4.184813	19.98916	25.00562
17	0.059369	25.88733	24.38637	4.323728	19.91584	25.48673
18	0.061059	25.69783	24.18136	4.472561	19.80295	25.84530
19	0.062694	25.62736	23.95823	4.618808	19.69022	26.10539
20	0.064320	25.55477	23.76772	4.764339	19.58791	26.32526
21	0.065931	25.44834	23.62051	4.898443	19.50415	26.52856
22	0.067506	25.31234	23.52173	4.995076	19.45902	26.71184
23	0.069041	25.14582	23.47102	5.051838	19.45732	26.87400
24	0.070540	24.94628	23.44912	5.086114	19.49424	27.02425
25	0.072006	24.71460	23.45142	5.105252	19.56057	27.16816
26	0.073448	24.45566	23.48206	5.111101	19.64332	27.30787
27	0.074863	24.18709	23.52790	5.106911	19.73047	27.44762
28	0.076244	23.92585	23.57298	5.096410	19.81828	27.58648
29	0.077593	23.67956	23.61345	5.084009	19.90345	27.71953
30	0.078914	23.45402	23.64684	5.075515	19.97875	27.84487

Cholesky Ordering: LRPI LTWNEER LM0 LQGDPT LUSEXPR

Furthermore, exchange rate shocks also contributed significantly to the variability in domestic prices. In fact over period 4 to period 15, exchange rate shocks contributed the most to the variability in prices. Growth in GDP also contributed to the variability in inflation with the percentage contribution to the variability increasing from 4.3 percent in period 4 to 20 per cent by period 30. Base money was the least important in influencing inflation; its percentage contribution in each period remained under 10 per cent.

Conclusion

The preliminary results from our investigation suggest that the shock to the exchange rate does not pass-through completely to domestic prices. Indeed, the pass through effect to inflation is higher for the prices of imported items than for the exchange rate. The results for the exchange rate shock appear contrary to a priori expectations and to the conclusions of other research, which show that exchange rate shocks especially in highly open developing countries, tend to have a high pass-through to domestic prices.

Interestingly, the results of this study also suggest that over the period 1982 to 2001, the hybrid approach to the explanation of inflation remains relevant in the case of Trinidad and Tobago. For example, an oil price shock has both a demand-pull and cost-push influence on the inflationary process. The demand-pull influence arises from the expansion of the money supply, while the cost push influence works through the exchange rate.

From a policy perspective, the results of the VAR analysis suggest a stronger cost push influence on the inflationary process in Trinidad and Tobago. This implies that a concentration on monetary policy alone may not be sufficient to control domestic inflation.

Selected References

Agbeyegbe, T. (1996): "The Stochastic Nature of Inflation", in *Problems and Challenges in Modelling and Forecasting for Caribbean Economies,* S. Nicholls, H. Leon and P. Watson (eds.), CCMS: St. Augustine, Trinidad & Tobago.

Allen, C. (2000): "Measuring Core Inflation", SES vol. 49, No. 2 & 3, pp. 270-312.

Bourne, Compton and Wilberne Persaud. (1977): "Financial Variables in the Inflationary Process: Two Caribbean Cases", in C. Bourne *Inflation in the Caribbean.*

Campa, J. and L. Goldberg (2001): "Exchange Rate Pass-Through into Import Prices: A Macro or Micro Phenomenon? (Mimeo), Federal Reserve Bank of New York.

Choudhri, E. and D. Hakura (2001): "Exchange Rate Pass-Through to Domestic Prices: Does the Inflationary Environment Matter?" IMF Working Paper 194.

Christopher, J. and T. Farrell (1987): "The Experience of Forecasting and Model Development at the Central Bank of Trinidad and Tobago", in *Monetary and Financial Policy in Trinidad and Tobago: Selected Central Bank Essays.*

Christopher-Nicholls, J. (1992): "Co-integration: An Application of the Johansen Procedure to Inflation in Trinidad and Tobago" (MSc. Dissertation), University of Warwick.

Cumberbatch, C. (1997): "A Model of Inflation in Barbados" in *Macroeconomics and Finance in the Caribbean: Quantitative Analysis,* D. Worrell and R. Craigwell (eds), CCMS: St. Augustine, Trinidad & Tobago.

Engle, C. and J. Rogers (1998): "Regional Patterns in the Law of One Price. The Roles of Geography versus Currencies" in Jeffrey A. Frankel (ed), *The Regionalization of the World Economy,* Chicago and London: The University of Chicago Press for NBER, pp. 153-83.

Eviews 4.0 User's Guide (2000): Quantitative Micro Software, LLC.

Farrell, T. W. (1984): "Inflation and Anti-Inflation Policy in Trinidad and Tobago: An Empirical Analysis," CEMLA, *Monetaria,* Vol. 7, No. 4 (in Spanish).

Farrell, T. W. and J. Christopher (1989): "Macro Monetary Relationships in the Caribbean: An Eclectic Review of Literature" in *Economic Adjustment Policies for Small Nations: Theory and Experience in the English Speaking Caribbean,* in D. Worrell and C. Bourne (eds.) New York: Praeger.

Farrell, T. (1990): "A Study of Central Banking in Developing Economy: 1964-1989" ISER

Gagnon, J. and J. Ihrig (2001): "Monetary Policy and Exchange Rate Pass-Through," Board of Governors of the Federal of the Federal Reserve System International Finance, Discussion Paper No. 704.

Kim, K. (1998): "US Inflation and the Dollar Exchange Rate: A Vector Error Correction Model," *Applied Economics,* 30, 613-19.

Leon, H. et al (1996): Inflation Convergence in Selected CARICOM Countries", in *Problems and Challenges in Modelling and Forecasting for Caribbean Economies,* S. Nicholls, H. Leon and P. Watson (eds.), CCMS: St. Augustine, Trinidad & Tobago.

Mann, C. (1986): "Prices, Profit Margins and Exchange Rates" *Federal Reserve Bulletin,* 72, 366-79.

McCarthy, J. (2000): "Pass-through of Exchange Rates and Import Prices to Domestic Inflation in Some Industrialized Economies," (Mimeo), Federal Reserve Bank of New York.

Nicholls, S., J. Nicholls and H. Leon (1995): "Money Price Causation in Four CARICOM Economies: A Preliminary Investigation" (Mimeo), presented at CCMS Conference, St. Kitts.

Rambarran, A. (2000): "An Inflation Targeting Framework for Trinidad and Tobago", (Mimeo) Central Bank of Trinidad and Tobago.

Ramjeesingh, D.H. (1974): "Inflation in Trinidad and Tobago." Department of Economics, UWI: Mona. Unpublished paper.

Robinson, W. (1998): "Forecasting Inflation using VAR Analysis", in *Econometric Modelling of Issues in Caribbean Economics and Finance,* S. Kim and T. Agebeyegbe (eds.), CCMS: St. Augustine, Trinidad and Tobago.

Seers, D. (1962): "A Theory of Inflation and Growth in Underdeveloped Economies Based on the Experience of Latin America", *Oxford Economic Papers,* June

St.Cyr, E.B.A (1974): "Rising Prices: An Explanatory Theoretical and Empirical Study of Trinidad and Tobago." CSO Research Papers, No. 4.

St. Cyr, E.B.A (1979): "A Note on the Trinidad and Tobago Inflationary Experience." Social and Economic Studies, Vol. 28, No. 3.

Stanley, R. (1996): "A Measure of Core Inflation: A First Approach to Inflation Targeting" (Mimeo), presented at the Annual Research Review Seminar, Central Bank of Barbados.

Swamy, P.A.V.B. (1994): "Exchange Rate Episodes and the Pass-Through of Exchange Rates to Import Prices," *Journal of Policy Modeling* 16 (6), pp. 609-623.

Taylor, A. (2000): "A Century of Purchasing-Power Parity," NBER Working Paper No. 8012 (Massachusetts: NBER).

Watson, P. and S. Teelucksingh (2002): *A Practical Introduction to Econometric Methods: Classical and Modern,* The University of the West Indies Press: Mona, Jamaica.

Wei, S. and D. Parsley (1995): "Purchasing Power Disparity during the Floating Period: Exchange Rate Volatility, Trade Barriers and Other Culprits", NBER Working Paper No. 5032.

Appendix 1

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests
Sample: 1982:1 2001:4
Included observations: 72

Dependent variable: LRPI

Exclude	Chi-sq	df	Prob.
LTWNEER	3.231900	4	0.5198
LM0	14.39858	4	0.0061
LQGDPT	10.24623	4	0.0365
LUSEXPR	3.300763	4	0.5088
LAUVOILWTI	2.560061	4	0.6339
T_BILL_RATE01	10.94984	4	0.0271
All	49.05507	24	0.0019

Dependent variable: LTWNEER

Exclude	Chi-sq	df	Prob.
LRPI	2.342308	4	0.6731
LM0	3.894024	4	0.4205
LQGDPT	1.809759	4	0.7707
LUSEXPR	2.922938	4	0.5708
LAUVOILWTI	8.376498	4	0.0787
T_BILL_RATE01	1.548401	4	0.8180
All	29.48813	24	0.2023

Dependent variable: LM0

Exclude	Chi-sq	df	Prob.
LRPI	5.315800	4	0.2564
LTWNEER	1.269577	4	0.8665
LQGDPT	4.937734	4	0.2937
LUSEXPR	0.863844	4	0.9297
LAUVOILWTI	10.98472	4	0.0267
T_BILL_RATE01	1.323594	4	0.8574
All	43.40198	24	0.0089

Dependent variable: LQGDPT

Exclude	Chi-sq	df	Prob.
LRPI	5.167347	4	0.2706
LTWNEER	11.84852	4	0.0185
LM0	5.926757	4	0.2047
LUSEXPR	3.373713	4	0.4973
LAUVOILWTI	1.125508	4	0.8902
T_BILL_RATE01	2.358629	4	0.6701
All	59.92222	24	0.0001

Appendix 1- Cont'd

Dependent variable: LUSEXPR

Exclude	Chi-sq	df	Prob.
LRPI	18.43118	4	0.0010
LTWNEER	7.268710	4	0.1224
LM0	6.637453	4	0.1563
LQGDPT	2.053439	4	0.7259
LAUVOILWTI	1.878513	4	0.7581
T_BILL_RATE01	20.84486	4	0.0003
All	45.28414	24	0.0054

Dependent variable: LAUVOILWTI

Exclude	Chi-sq	df	Prob.
LRPI	0.258583	4	0.9923
LTWNEER	6.537938	4	0.1624
LM0	1.731410	4	0.7850
LQGDPT	4.221477	4	0.3769
LUSEXPR	5.443318	4	0.2448
T_BILL_RATE01	0.667755	4	0.9552
All	30.93769	24	0.1556

Dependent variable: T_BILL_RATE01

Exclude	Chi-sq	df	Prob.
LRPI	4.635685	4	0.3268
LTWNEER	0.961174	4	0.9156
LM0	6.428945	4	0.1693
LQGDPT	12.16005	4	0.0162
LUSEXPR	7.394330	4	0.1165
LAUVOILWTI	0.798736	4	0.9386
All	27.15512	24	0.2973

Appendix 2

Included observations: 75 after adjusting end points
Trend assumption: Linear deterministic trend (restricted)
Series: LRPI LTWNEER LM0 LQGDPT LUSEXPR
Exogenous series: LAUVOILWTI T_BILL_RATE01
Warning: Critical values assume no exogenous series
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.491244	106.0341	87.31	96.58
At most 1	0.347820	55.35006	62.99	70.05
At most 2	0.156445	23.29244	42.44	48.45
At most 3	0.093412	10.53269	25.32	30.45
At most 4	0.041483	3.177618	12.25	16.26

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.491244	50.68403	37.52	42.36
At most 1 *	0.347820	32.05762	31.46	36.65
At most 2	0.156445	12.75975	25.54	30.34
At most 3	0.093412	7.355070	18.96	23.65
At most 4	0.041483	3.177618	12.25	16.26

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 2 cointegrating equation(s) at the 5% level
Max-eigenvalue test indicates 1 cointegrating equation at the 1% level

Appendix 3

Vector Error Correction Estimates
Date: 11/01/02 Time: 13:20
Sample(adjusted): 1983:2 2001:4
Included observations: 75 after adjusting endpoints
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	**CointEq1**
LRPI(-1)	1.000000
LTWNEER(-1)	-0.145333 (0.02160) [-6.72808]
LM0(-1)	-0.082845 (0.02615) [-3.16754]
LQGDPT(-1)	0.864003 (0.07246) [11.9241]
LUSEXPR(-1)	-0.285766 (0.10186) [-2.80536]
@TREND(82:1)	-0.016529 (0.00030) [-54.7481]
C	-5.086030

Error Correction:	**D(LRPI)**	**D(LTWNEER)**	**D(LM0)**	**D(LQGDPT)**	**D(LUSEXPR)**
CointEq1	-0.274572 (0.12096) [-2.26986]	1.904704 (0.77062) [2.47165]	1.724483 (0.71922) [2.39772]	0.784572 (0.19376) [4.04919]	0.219991 (0.09949) [2.21124]
D(LRPI(-1))	0.479760 (0.14573) [3.29208]	-1.852066 (0.92840) [-1.99490]	-0.926972 (0.86648) [-1.06982]	-1.035312 (0.23343) [-4.43517]	-0.101469 (0.11986) [-0.84658]
D(LRPI(-2))	0.255301 (0.14034) [1.81916]	-0.922982 (0.89406) [-1.03235]	-0.489355 (0.83442) [-0.58646]	-0.618130 (0.22480) [-2.74972]	-0.177093 (0.11542) [-1.53428]
D(LRPI(-3))	0.020760 (0.12837) [0.16172]	-0.684432 (0.81781) [-0.83691]	-0.237849 (0.76326) [-0.31162]	-0.390224 (0.20563) [-1.89773]	0.062582 (0.10558) [0.59274]
D(LRPI(-4))	0.389355 (0.11371) [3.42419]	-0.352002 (0.72439) [-0.48593]	0.181797 (0.67607) [0.26890]	-0.331313 (0.18214) [-1.81904]	-0.142022 (0.09352) [-1.51864]

Appendix 3 - Cont'd

Error Correction:	D(LRPI)	D(LTWNEER)	D(LM0)	D(LQGDPT)	D(LUSEXPR)
D(LTWNEER(-1))	-0.032328	-0.006818	-0.080093	0.128149	0.017349
	(0.02476)	(0.15771)	(0.14719)	(0.03965)	(0.02036)
	[-1.30587]	[-0.04323]	[-0.54414]	[3.23170]	[0.85210]
D(LTWNEER(-2))	-0.005159	-0.071339	0.195917	0.073689	0.003238
	(0.02423)	(0.15439)	(0.14409)	(0.03882)	(0.01993)
	[-0.21289]	[-0.46208]	[1.35970]	[1.89833]	[0.16246]
D(LTWNEER(-3))	0.053911	0.095961	0.105844	-0.025071	0.025570
	(0.02270)	(0.14463)	(0.13499)	(0.03637)	(0.01867)
	[2.37458]	[0.66348]	[0.78411]	[-0.68942]	[1.36941]
D(LTWNEER(-4))	0.006962	0.089189	0.409416	-0.051734	-0.011480
	(0.02263)	(0.14414)	(0.13453)	(0.03624)	(0.01861)
	[0.30769]	[0.61877]	[3.04341]	[-1.42747]	[-0.61694]
D(LM0(-1))	-0.037449	0.079180	-0.018101	0.049365	-0.020214
	(0.02009)	(0.12801)	(0.11947)	(0.03219)	(0.01653)
	[-1.86371]	[0.61854]	[-0.15151]	[1.53371]	[-1.22312]
D(LM0(-2))	-0.027211	0.226769	-0.216102	0.085664	0.008259
	(0.01946)	(0.12397)	(0.11570)	(0.03117)	(0.01600)
	[-1.39832]	[1.82922]	[-1.86776]	[2.74824]	[0.51601]
D(LM0(-3))	-0.067668	0.122233	-0.116019	7.20E-05	-0.031681
	(0.01994)	(0.12702)	(0.11855)	(0.03194)	(0.01640)
	[-3.39384]	[0.96230]	[-0.97866]	[0.00226]	[-1.93192]
D(LM0(-4))	0.001431	0.004107	-0.173476	-0.041009	-0.026444
	(0.01917)	(0.12213)	(0.11398)	(0.03071)	(0.01577)
	[0.07466]	[0.03363]	[-1.52196]	[-1.33548]	[-1.67721]
D(LQGDPT(-1))	0.282194	-1.311710	-0.643004	-1.272995	-0.108889
	(0.15202)	(0.96849)	(0.90389)	(0.24351)	(0.12503)
	[1.85625]	[-1.35439]	[-0.71137]	[-5.22765]	[-0.87088]
D(LQGDPT(-2))	0.133952	-1.196442	-0.943188	-0.798910	-0.153508
	(0.13827)	(0.88086)	(0.82210)	(0.22148)	(0.11372)
	[0.96879]	[-1.35827]	[-1.14729]	[-3.60718]	[-1.34988]
D(LQGDPT(-3))	0.037739	-1.239357	-1.067862	-0.734099	-0.058797
	(0.11933)	(0.76023)	(0.70952)	(0.19115)	(0.09815)
	[0.31625]	[-1.63025]	[-1.50505]	[-3.84049]	[-0.59907]
D(LQGDPT(-4))	0.113532	-0.776153	-0.738273	-0.346103	-0.007246
	(0.08927)	(0.56868)	(0.53075)	(0.14299)	(0.07342)
	[1.27184]	[-1.36483]	[-1.39100]	[-2.42053]	[-0.09870]
D(LUSEXPR(-1))	0.145404	-0.990962	-1.406740	-0.104857	0.380354
	(0.15724)	(1.00172)	(0.93490)	(0.25187)	(0.12932)
	[0.92473]	[-0.98926]	[-1.50470]	[-0.41632]	[2.94112]

Appendix 3 - Concluded

Error Correction:	D(LRPI)	D(LTWNEER)	D(LM0)	D(LQGDPT)	D(LUSEXPR)
D(LUSEXPR(-2))	-0.020845	0.592561	1.018736	0.039574	-0.236797
	(0.15840)	(1.00912)	(0.94181)	(0.25373)	(0.13028)
	[-0.13160]	[0.58721]	[1.08168]	[0.15597]	[-1.81762]
D(LUSEXPR(-3))	0.299704	-0.143015	-1.733499	-0.669257	0.110106
	(0.15492)	(0.98694)	(0.92111)	(0.24815)	(0.12742)
	[1.93457]	[-0.14491]	[-1.88196]	[-2.69696]	[0.86415]
D(LUSEXPR(-4))	-0.101358	0.383469	2.382379	-0.034232	0.117359
	(0.14923)	(0.95069)	(0.88728)	(0.23904)	(0.12274)
	[-0.67921]	[0.40336]	[2.68504]	[-0.14321]	[0.95619]
C	-0.006611	0.112354	0.068572	0.045876	0.024685
	(0.02165)	(0.13795)	(0.12875)	(0.03469)	(0.01781)
	[-0.30532]	[0.81444]	[0.53259]	[1.32262]	[1.38603]
LAUVOILWTI	0.002102	-0.031205	-0.053272	-0.018370	-0.005841
	(0.00637)	(0.04058)	(0.03787)	(0.01020)	(0.00524)
	[0.33009]	[-0.76906]	[-1.40676]	[-1.80066]	[-1.11502]
T_BILL_RATE01	-0.000433	0.006395	0.017004	0.007202	0.000245
	(0.00085)	(0.00539)	(0.00503)	(0.00135)	(0.00070)
	[-0.51237]	[1.18760]	[3.38322]	[5.31918]	[0.35186]
R-squared	0.599202	0.291224	0.523518	0.624996	0.512180
Adj. R-squared	0.418450	-0.028420	0.308634	0.455877	0.292183
Sum sq. resids	0.004333	0.175846	0.153169	0.011117	0.002931
S.E. equation	0.009217	0.058719	0.054803	0.014764	0.007581
F-statistic	3.315053	0.911089	2.436283	3.695594	2.328119
Log likelihood	259.5435	120.6660	125.8433	224.2089	274.2029
Akaike AIC	-6.281159	-2.577760	-2.715822	-5.338904	-6.672078
Schwarz SC	-5.539563	-1.836164	-1.974226	-4.597308	-5.930482
Mean dependent	0.017252	0.001177	0.008272	0.000756	0.002486
S.D. dependent	0.012087	0.057902	0.065909	0.020015	0.009011

Determinant Residual Covariance	8.89E-18
Log Likelihood	1012.535
Log Likelihood (d.f. adjusted)	940.2233
Akaike Information Criteria	-21.71262
Schwarz Criteria	-17.81924

16

Consumer Price Inflation and Exchange Rate Pass-through in Jamaica

Lavern McFarlane[1]

Abstract

The exchange rate has long been viewed as the nominal anchor in the design of monetary policy. However, recent trends in exchange rate movements and prices have raised questions about the nature of the pass-through. Against this background this paper analyses the relationship between exchange rate and prices in Jamaica and how this has evolved over the past twelve years. The results indicate that, in the long run, the exchange rate pass-through is almost 'complete'. However, the extent of the pass-through has slowed in recent years due in part to the shift to a tighter monetary policy regime, more stable exchange rate and increased competition. Despite this, however, exchange rate movements still have a significant influence on prices and inflationary expectations. Further, the pass-through is likely to accelerate in an environment of increased exchange rate instability.

1.0 Introduction

The conduct of monetary policy and the ability of a central bank to respond adequately to different shocks require an understanding of the transmission mechanism of monetary policy. In a small open economy such as Jamaica, the exchange rate provides an important transmission channel for monetary policy, in addition to the standard aggregate demand channel. The objective of this paper, therefore, is to understand the exchange rate pass-through, that is, the extent to which exchange rate changes alter relative prices.

The expression 'exchange rate pass-through' is generally used to refer to the effect of exchange rate changes on one of the following: (1) import and export prices, (2) consumer prices, (3) investments and (4) trade volumes. The focus of this paper is on the effects of exchange rate changes on consumer prices. This

---

1 This paper has benefited from the comments of members of staff of the research department and two anonymous referees. The views expressed are those of the author and do not necessarily reflect those of the Bank of Jamaica.

interest stems from the fact that changes in the exchange rate pass-through to consumer prices are integral to the design of monetary and exchange rate policies and an important indicator for the private sector. Additionally, a low exchange rate pass-through is thought to provide greater freedom for pursuing an independent monetary policy and facilitates inflation targeting.

Previous studies on Jamaica have found that the exchange rate pass-through to prices and wages is significant.[2] However, those analyses were conducted during a period of expansionary policy. In contrast, over the past five years, money supply growth has been curtailed, inflation has fallen significantly and the economy has become more competitive. Consequently, the degree and pattern of exchange rate pass-through may have shifted.

In this context, this paper develops and tests an exchange rate pass-through model, similar to those used for Australia and New Zealand, concentrating primarily on the post-1995 period. The study hypothesizes that consequent on shifts in policy and other structural changes, the degree of exchange rate pass-through has slowed over the last five years. Further, given barriers to entry and the role of imported goods, particularly food commodities, this pass-through varies across commodities. To the extent that agriculture prices are influenced by seasonal factors, excluding them may give a better picture of the pass-through. On the other hand, it could be argued that because of the weight of agriculture prices in the CPI, excluding them may in fact bias the results. As such, the paper studies the effects on the All Jamaica Consumer Price Index (CPI), and the CPI, excluding agriculture.

The paper finds that prior to 1996, a 1.0 per cent shock to the nominal exchange rate resulted in a 0.167 per cent increase in the consumer price level one month after the initial shock. The effect of the shock dies out after ten months. In the post 1995 period a 1.0 per cent depreciation of the nominal exchange rate leads to an increase of 0.11 per cent in the consumer price level after one month and dies out after about eleven months. Additionally, excluding agriculture prices from the CPI showed different results. Prior to 1996, a 1.0 per cent shock to the nominal exchange rate resulted in an increase in the CPI - excluding agriculture prices (CPIAG), of 0.142 per cent one month after the initial shock, while in the post 1995 period, a 1.0 per cent shock to the nominal exchange rate resulted in a 0.134 per cent increase in the CPIAG, one month after the initial shock, while the pass-through has lessened, however, the influence of exchange rate movements on prices and expectations are still significant. A re-emergence of foreign exchange market instabilities could increase the rate of pass-through. Further, with the recovery in income and demand, suppliers will become more willing to pass on imported costs.

The remainder of the paper is organized as follows. Section 2 gives a brief discussion of the empirical and theoretical literature on exchange rate pass-through, and this is followed by an overview of inflation and exchange rate trends in Jamaica, in Section 3. The data and empirical methodology are discussed in Section 4. The results are discussed in Section 5. Section 6 highlights and

---

2 See Robinson (1996).

evaluates the effect of an unanticipated devaluation of the Jamaican currency. The conclusion is presented in Section 7.

2.0 Literature Review

According to Goldberg and Knetter (1997), exchange rate pass-through is defined as "the percentage change in local currency import prices resulting from a one percent change in the exchange rate between the exporting and importing countries." Two channels of exchange rate pass-through are identified in the literature: a direct channel and an indirect channel.[3] Both channels are equally important in an open economy. Taylor (2000) suggests another channel via expectations. According to this view, pass-through is highest when exchange rate changes are perceived to be persistent and prices adjust because of the expectations of the public. The transmission mechanism is demonstrated in Chart 1.

The *direct* channel arises mainly because of the "law of one price"[4] and the purchasing power parity (PPP) in its aggregation. The paper alludes to the relative version of PPP, which claims that starting from a base of an equilibrium exchange rate between two currencies, the future of the exchange rate between the two currencies will be determined by the relative movements in the price levels in the two countries. For a given import price, changes in the exchange rate will translate directly into higher domestic prices.

$$P = E \bullet P^*$$

where E is the exchange rate in terms of domestic currency per unit of foreign currency; P^* represents the foreign currency price of the imported good and P is the domestic currency price of the imported good. The pass-through is only complete (=100 percent) if (a) markups of prices over costs are constant and (b) marginal costs are constant.[5]

The *indirect* channel of exchange rate pass-through arises because of the impact on aggregate demand. A depreciation of the exchange rate makes domestic products relatively cheaper for foreign consumers and as a consequence exports and aggregate demand will rise relative to potential output, inducing an increase in the domestic price level. Since nominal wage contracts are fixed in the short run, real wages will decrease and output will eventually increase. However, when real wages return to their original level over time, production costs then increase, the overall price level increases and output falls. Thus, in the end, the

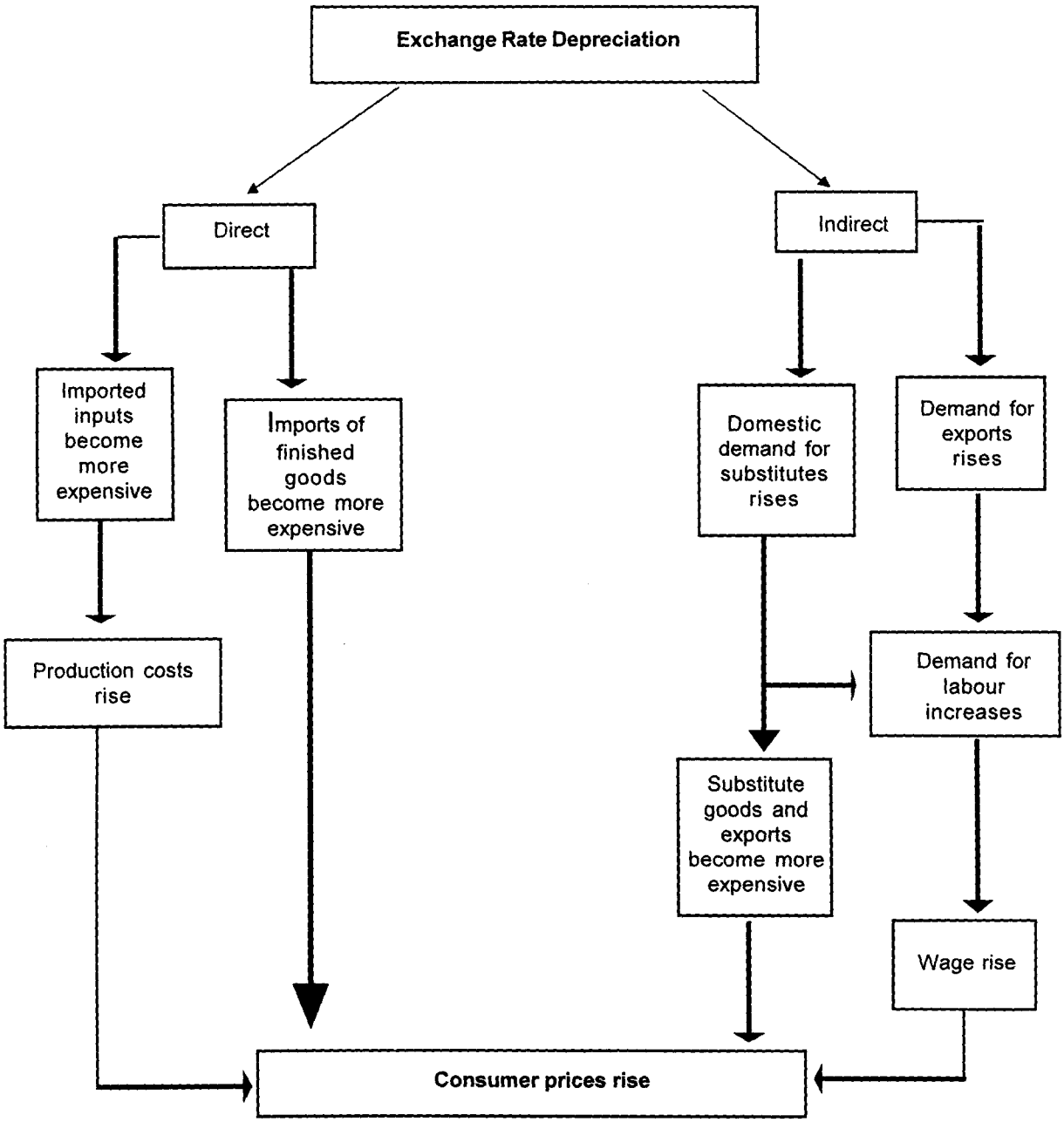
---

3 See Kahn, 1987, Menon, 1995 and Goldberg and Knetter, 1997 for an exhaustive discussion of exchange rate pass-through.

4 See Menon (1991a) for a comprehensive discussion of the relationship between the law of one price and exchange rate pass-through.

5 See Goldberg and Knetter, 1997:1248

Chart 1.
Transmission Mechanism of Exchange Rate Pass-through



exchange rate depreciation leaves a permanent increase in the price level with only a temporary increase in output.[6]

The main factors that were found to influence the degree of pass-through are the openness and size of the economy. Other factors included relative elasticities of demand and supply for traded goods, macroeconomic conditions and the microeconomic environment. Kent (1995) argues that in the absence of other shocks, for exports, the degree of pass-through will increase, the greater the elasticity of demand and the smaller the elasticity of supply. Conversely, for imports, the degree of pass-through will increase, the lower the elasticity of demand and the greater the elasticity of supply. From this, Kent concludes that pass-through will be complete in the case of a small open economy, where exporters are assumed to face perfect elasticity of demand, while importers face perfect elasticity of supply, so that the country is a price taker in world markets.

Macroeconomic shocks may operate either to reinforce or counteract the influence of demand and supply elasticities. For instance, when domestic demand is buoyant or capacity is constrained, the extent of exchange rate pass-through for imports is likely to be high, irrespective of the relative elasticities of demand and supply.[7] In fact, firms may face a macroeconomic shock of sufficient magnitude to generate a permanent change in the volume of goods traded and the degree of pass-through.[8]

There are a number of explanations for a low pass-through. Dornbusch (1987) and Krugman (1987) show that a less than one-to-one transmission can be explained by imperfect competition and "pricing-to-market". When homogeneous products are traded in an integrated world market, arbitrage eliminates differentials in the common currency price of goods. However, when markets are imperfectly competitive and segmented, a wide range of pricing responses is possible.[9] For example, if agents seek to maximize market share rather than profit, pass-through may be incomplete. Furthermore, if opportunities exist to discriminate between markets, "pricing-to-market" may occur, yielding different degrees of pass-through across a range of segmented markets.

Menon (1995) presents an overview of 43 empirical studies of exchange rate pass-through for both developed and developing countries. He found that the degree of pass-through was quite different across countries. This, he argues, resulted from the use of different methodology, model specification and variable selection, rather than from the different time periods studied. Although the degree of pass-through varies across countries and over time, a number of studies have found that the pass-through to consumer prices is generally weak or incomplete.[10]

---

6 See Khan, 1987

7 See Piggot and Reinhart, 1985 and Phillips, 1988

8 This possibility is most often considered with respect to large changes in the exchange rate. However, such shocks may also include domestic demand.

9 Phillips (1988) explores the microeconomic aspects of pass-through.

10 See also Engel (1993) and Parsley and Wei (2001).

An implication of these results is that a change in the nominal exchange rate might not lead to much substitution between domestically produced goods and internationally-produced goods, because the relative prices of those goods faced by the final consumer do not change much.

Following on Menon (1995), there has been some empirical work that attempted to improve on the methodological deficiencies of earlier studies. McCarthy (2000) investigated the exchange rate pass-through on the aggregate level for selected industrialized economies. He estimated a VAR model for the period 1976 – 1998 over the whole distribution chain[11] and found that pass-through of exchange rate changes to consumer prices is modest in most of the countries. The import share of a country and the persistence of exchange rate changes were found to be positively correlated with the extent of pass-through to consumer prices, while exchange rate volatility was found to be negatively correlated. McCarthy (2000) found that the pass-through appears to be larger in countries with a higher import share of domestic demand, as well as in countries with more persistent exchange rate and import prices. He argued that if a country's import share can be assumed to be a good proxy for the import penetration faced by firms, then a country with a larger import share should have greater pass-through of exchange rate and import price fluctuations to domestic prices. In addition, both because of a direct effect, as well as through a greater pass-through, exchange rates and import prices should be more important in explaining domestic price fluctuations as the import share increases.

Kim (1998) estimates the exchange rate pass-through for the USA, using cointegration analysis and a vector error correction model (VECM). His paper relates producer price inflation in the USA to the trade-weighted effective exchange rate, money supply, aggregate income and interest rates. In contrast to other studies, he finds that fluctuations in the exchange rate have a significant negative effect on the USA producer price inflation rate, which is supported by Granger causality tests. Kim posits that this outcome is due to the fact that inflation is caused by many other factors that also influence the demand for and supply of imports and exports. For instance, he argues that if an appreciation of the dollar is accompanied by reduced foreign supply, or by an increased demand for imports is caused by a rapid growth in the money supply or income, the impact of the exchange rate change on the inflation rate would likely be neutralized or prices might even rise. Moreover, the exchange rate effects can be mitigated or even nullified by foreign suppliers adjusting their profit margin to absorb some or all of the impact of the price changes.

3.0 Exchange Rates and Inflation in Jamaica

With annual inflation rates averaging 23.94 per cent between 1990 and 2001, Jamaica may be considered a 'moderate' inflation economy. However, Figure 1 – Appendix shows that inflation has been trending downwards over the period,

---

11 Import, producer and consumer prices.

with monthly inflation averaging 2.72 per cent over the 1990 to 1995 period and 0.73 per cent over the 1996 to 2001 period. Much of the deviation from the average long-run trend, which occurred primarily in 1991, corresponded to shocks from the exchange rate, money growth and structural shocks such as import prices and domestic costs.[12]

Figure 1 in the Appendix shows that the variation in the exchange rate is correlated with the trends in the inflation rate. Since 1990 the exchange rate has been market-determined. With the introduction of this exchange rate regime, the Jamaican currency depreciated sharply against the U.S. dollar between 1991 and early 1992. Against this background, the inflation rate increased significantly in the immediate period following the sharp depreciation in the Jamaican currency. In the 1990 to 1995 period, the movements in the exchange rate initially reflected the overvaluation which previously existed and subsequently the initial looser monetary conditions. The Bank of Jamaica responded to the depreciation by raising the reserve requirements.

Since 1995, the Bank has focused monetary policy on inflation reduction through tight base money management. The Bank became more explicitly focused on its inflation targets, with the monetary base being the operating target and the money supply and changes in the exchange rate the intermediate targets. The main tool of monetary policy was open-market operations.

Relatively low inflation rates were achieved in the post 1995 period, with annual inflation rates averaging approximately 9.0 per cent. The monthly rates of inflation during the period fluctuated from a high of 3.3 per cent in February 1996 to a low of –1.1 per cent in February 1999. During this period, being a small economy, trade liberalization accelerated in tandem with the increased globalization. Additionally, there has been increased competition in the domestic economy. By 1997, inflation was 9.2 per cent, reflecting macroeconomic stability (See Figure 1 - Appendix),[13] and has fallen steadily each year.

4.0 Data and Methodology

4.1 Data

The empirical analysis uses monthly data from January 1990 to December 2001. Inflation is measured by the change in the log of the headline consumer price index (CPIJ) and an adjusted CPI, which excludes *starchy foods* and *vegetables and fruits* (CPIAG). The exchange rate is the weighted average nominal selling rate (NEXR). The U.S. currency was used since it is the currency of Jamaica's major trading partner. The Treasury Bill rates (average discount rates on 3-month instruments) (INTRATE) and base money (BM) are used to reflect changes in the Central Bank's behaviour. The variables were adjusted to capture the seasonal influences in the data. To get an indication of the change in the pass-

12 See Robinson, 1996.

13 Figure 1 plot consumer price inflation and exchange rate changes, quarterly data. The exchange rate measure shown in the figure is calculated against a weighted average.

through post 1995, the sample was split into two time periods 1990:01 to 1995:12 and 1996:01 to 2001:12.

4.2 Methodology

Given the absence of monthly output data, the analysis is restricted to focusing on the influence of the *direct* channel. In this context the pass-through relation can be expressed most simply by the PPP relation in logs i.e.

$$p = \beta p^* + \lambda e \qquad (1)$$

The "law of one price" implies that $\beta=\lambda=1$ in which case changes in the exchange rate completely pass through to the domestic price of the traded good. If foreign prices are set as a markup over costs then (1) can be expressed as

$$p = \beta(1+m)c^* + \lambda e \qquad (2)$$

where c^* symbolizes the cost of producing the goods and m represents foreign mark-up. This simple expression forms the basis of analyzing the long-run pattern of exchange rate pass-through. If the goods and factor markets in the foreign country are competitive and output shocks are temporary then the first term should be relatively stable over time.

Similar to Parsley and Popper (1998), the paper extends this expression to take account of the Central Bank's behaviour by including base money and interest rates.

$$p = \beta(1+m)c^* + \lambda_1 e_t + \lambda_2 b_t + \lambda_3 i_t \qquad (3)$$

Central banks that target consumer price inflation will try to insulate prices from exchange rate movements. Neglecting the behaviour of policy variables would therefore distort the estimates of the effects of variations on consumer prices. By including policy variables, the observed relationship between prices and exchange rates would take into account the central bank's behaviour rather than the direct influence of exchange rates on prices.[14] Traditional economic theory has been applied on the assumption that economic series have a constant mean and finite variance, that is, the variables are stationary.[15] In practice,

---

14 Both Parsley and Popper, 1998, and McCarthy, 2000, include a monetary aggregate in their system of variables. Bernanke and Mihov, 1997, included interest rates instead; they showed that monetary targets were not significant in the Bundesbank reaction function. Further, most central banks in the world now target short-term interest rates. Gerlach and Svensson, 2000, provide further evidence for the euro area that the relationship between money growth and future inflation is weak at best. We follow a combination of these models, to include both interest rates and monetary aggregates.

15 A non-stationary series on the other hand is characterized by a time-varying mean or variance.

however, most economic series are not stationary and consequently OLS estimation will lead to spurious results. Recent developments however, have shown that standard regression analysis can be applied if a linear combination of non-stationary variables is a stationary process, that is, if a cointegrating relationship exists.[16]

Based on this, the relation in (3) is estimated in a vector error correction form

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \phi \Delta c_t^* + v_t ,$$

where $Y = [e,b,i]'$ and c_t^* enters exogenously since the domestic economy is a price taker. The time series properties of the data are analyzed using the Dickey-Fuller and KPSS tests for unit roots. The Johansen (1991) full information maximum likelihood procedure is used to estimate the VECM and to test cointegrating rank of Π.

The dynamic interaction among the variables and hence the pass-through is analyzed using impulse responses and variance decomposition. Whereas impulse response functions trace the effects of a shock to one endogenous variable on to the other variables in the VECM, variance decomposition separates the variation in an endogenous variable into the component shocks to the VECM. Thus, the variance decomposition provides information about the relative importance of each innovation.

Innovations are generally correlated, implying that their components are common among shocks. It was therefore necessary to impose some structure on the system in order to properly identify the innovations. The paper adopts the common approach in which the covariance matrix is transformed (i.e. diagonalized) using a Cholesky decomposition such that all the common components of the innovations are attributed to the variable that comes first in the system. In this regard, the following ordering was used:

Base Money → interest rate → exchange rate → CPI

This is based on an a priori notion that in the transmission process, liquidity conditions influence the interest rates which, through induced portfolio adjustments, affect the exchange rate. The exchange rate in turn influences the CPI *via* the *direct* channel. Granger Causality tests reported in Table 1a - Appendix support this ordering. Alternative orderings did not change the results significantly. To adequately capture the possible two-way causation of interest rate and exchange rate, an intervention dummy was modelled exogenously to account for instances when exchange rate influenced interest rates. The dummy takes the value of one when interest rates are influenced by movements in the

16 See Engle and Granger, 1987.

exchange rate, and zero otherwise. In the post-1995 period where the policy of the Central Bank has been to maintain a low inflation stance, increases in interest rates tend to result from pressures in the foreign exchange market.

In McCarthy (2000) interest rates entered last, as he assumed a reactive behaviour of the central bank. However, it is argued that the position of the interest rate might also be prior to consumer prices. Given the variable lags of monetary policy, central banks usually react to expected inflation rather than realized inflation (forward-looking behaviour).[17] In this respect it would be appropriate to position the interest rate variable prior to the consumer price index, that is, allowing prices react to the central bank's policy.

5.0 Results

The complete test statistics for the unit root tests[18] are given in Table 2 in the Appendix. (See Table A below for a summary of the results). The KPSS tests the null hypothesis "stationarity", or stationarity around a deterministic trend, against a unit root alternative. Several recent studies have argued that the standard unit root tests, such as Dickey-Fuller tests have low power against stable autoregressive alternatives with roots near unity and also against fractionally integrated alternatives.[19] These findings exist in a context where most economic time series are not very informative about whether or not there is a unit root, or equivalently, that standard unit root tests are not very powerful against relevant alternatives. Kwiatkowski *et. al.* (1992) suggest that in trying to decide by classical methods whether economic data are stationary or integrated, it would be useful to perform tests of the null hypothesis of stationarity, as well as tests of the null of a unit root.

Table A
Summary Unit Root Test Results – with Constant and Trend

	CPI	CPIAG	BM	INTRATE	NEXR
Dickey-Fuller[1]	-1.608	-1.714	-1.227	-3.039	-3.223
Perron[2]	-2.152	-2.465	-0.195	-4.363	-2.937
KPSS[3]	0.333	0.329	0.352	0.277	0.161

1 D-F 5% level of significance: -3.442.
2 Perron 5% level of significance: 3.76.
3 KPSS 5% level of significance: 3.76.

17 See Clarida *et. al.* (1999).

18 (a) Only with a constant and (b) with constant and trend.

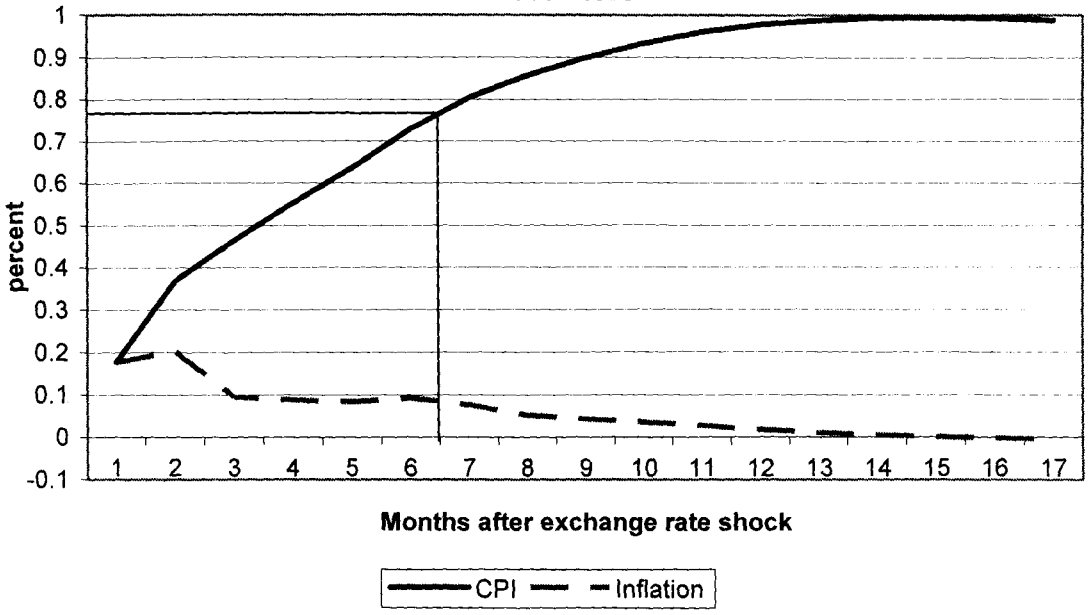
19 See DeJong *et al.* (1989) and Diebold and Rudebusch (1990).

All variables, with the exception of the interest rate,[20] are clearly non-stationary as the KPSS test rejects the null hypothesis of stationarity in both test versions at the 5 per cent and one per cent significance levels. This is also supported by the Dickey-Fuller test and, with the exception of the interest rate, the Perron unit root test with structural break at 1995.

The Schwarz information criterion suggest a VECM with two lags. Additionally, no root lies outside the unit circle, hence the VAR satisfies the stability condition. Table 2 in the Appendix reports the results of the Johansen tests. The hypothesis $r = 0$ is rejected at the 5% and 1% levels in favour of a unique cointegrating relation across the samples. Further evidence for $r = 1$ can be obtained from the estimated adjustment coefficients a, which indicate significant adjustment (in the sense of error correction) only in the first cointegrating vector.

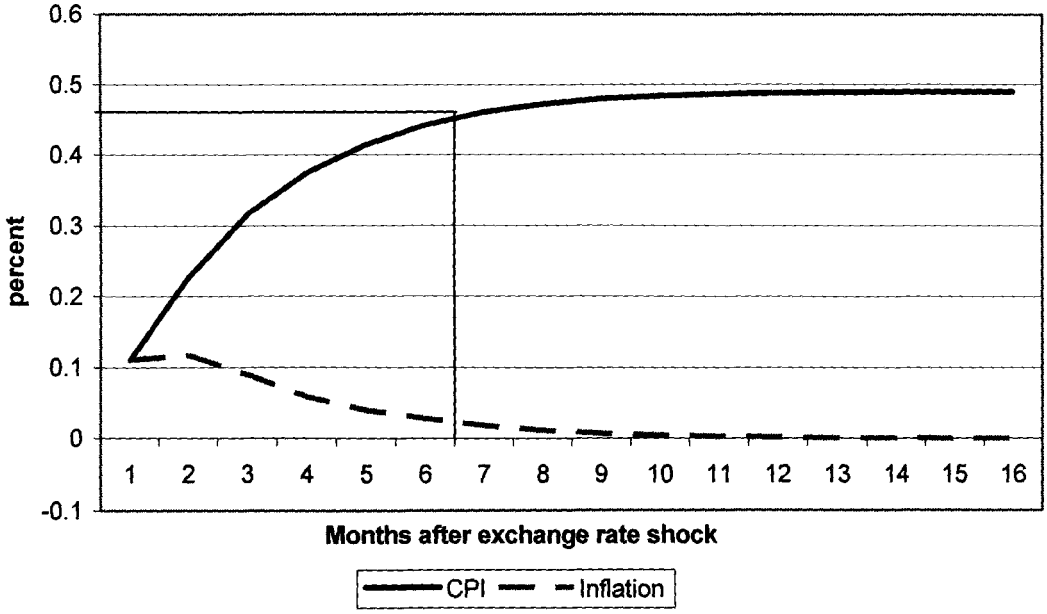
Tables 4a to 4c in the Appendix give the normalized values of the long-run matrix, β, and the adjustment coefficient α. All coefficients are significant and have their anticipated (or at least plausible) signs. The consumer price index responds positively to the exchange rate, i.e. depreciation in the exchange rate results in an increase in the consumer price index. The coefficient to NEXR could be interpreted as the long-run pass-through coefficient, indicating that a 1 per cent devaluation results in a 0.996 and a 0.982 per cent rise in the consumer price level, an almost 'complete' pass-through for the full sample and the post 1995 period, respectively.

Figure A. Response of CPI to a 1% Depreciation
1990 - 1995



20 KPSS test rejects the null hypothesis with a constant, but does not reject the null hypothesis with a constant and trend.

Figure B. Response of CPI to a 1% Depreciation
1996 - 2001



5.1 Impulse Response and Variance Decomposition

Figures 2a in the Appendix shows the response of the CPI to a 1.0 per cent shock to the exchange rate for the full sample. The exchange rate shock feeds through to the CPI gradually, with the rate of increase slowing over the sample period 1990:01 to 2001:12, indicating that pass-through has slowed in recent years. Figure A[21] below reveals that for the period 1990:01 to 1995:12, a 1.0 per cent shock to the exchange rate does not have an immediate effect on the CPI, with the pass-through being approximately 80.0 per cent complete six months after the initial shock to the nominal exchange rate. On the other hand, Figure B indicates that in the last five years, a 1.0 per cent shock to the exchange rate results in the pass through being approximately 45.0 per cent complete six months after the initial shock to the nominal exchange rate.

Table B below summarizes the responses of the CPI to a 1.0 per cent shock in the nominal exchange rate[22] after 3, 6, 9 and 12 months. The extent and speed of pass-through differ across time. In the first sample period, 1990:01 to 1995:12, the pass through is 98.8 per cent complete one year after the shock to the nominal exchange rate. In contrast, in the sample period 1996:01 to 2001:12, the effect of a 1.0 per cent shock in the nominal exchange rate to inflation is much smaller,

---

21 Solid line shows the accumulated responses *t* periods after the shock. The dotted line shows the discrete responses in period *t*.

22 An increase corresponds to a depreciation

that is, the pass-through is 48.8 per cent complete one year after an initial shock to the nominal exchange rate. In essence, Table B and the graphs above are showing that the degree of pass-through is lower and has slowed in the last five years.

Table B. Effects of CPI to a 1%-Exchange Rate Shock

Sample	After 3 months	After 6 months	After 9 months	After 12 months
1990:01 – 2001:12	0.482	0.620	0.836	1.001
1990:01 – 1995:12	0.464	0.728	0.898	0.988
1996:01 – 2001:12	0.316	0.442	0.479	0.488

As indicated earlier, the literature highlights several factors that influence the degree of pass-through. These include openness, the relative size of the economy, relative elasticities of demand and supply and macroeconomic conditions. One plausible explanation for a reduction in the degree of the pass-through over the two sub-samples is the influence of the macroeconomic environment. Relatively low and stable inflation observed in the post 1995 period would tend to be associated with lower pass-through than the high inflation economy that characterized 1990 to 1995. A low inflation regime would tend to lower the pass-through by weakening the expected future effect of the shocks. Additionally, low inflation economies could be subjected to less variable monetary shocks, particularly in a context where tight monetary policy is being exercised. The lower variability of monetary shocks would decrease the information content of the exchange rates in predicting monetary shocks and as such the pass-through would be smaller under a low inflation regime. On the other hand, a higher degree of pass-through in the pre-1995 period could be reflecting the initial impact of a liberalized foreign exchange rate market.

Although the impulse responses indicate the extent of pass-through to domestic prices, they do not indicate how important these shocks have been in domestic price fluctuations. To investigate the importance of the variables in the model to domestic inflation, the variance decompositions were examined. Table C below summarizes the variance decomposition for the sample periods six months after an initial shock to the nominal exchange rate. Tables 5a to 5c in the Appendix display a more detailed variance decomposition of the CPI to a 1.0 per cent shock in the nominal exchange rate after 6, 12 and 24 months. CPI variance is affected by exchange rate fluctuations to a large degree, prior to 1996. The results in Table 5b in the Appendix show that exchange rate fluctuations explain on average 36 per cent of the fluctuations in the CPI. However, post 1995 this ratio has been significantly reduced. Table 5c in the Appendix indicates that on average, approximately 10.5 per cent of the variations in the CPI are explained by variations in the exchange rate. Variations in the CPI are largely explained by shocks to itself, suggesting that the inflation process in Jamaica has significant inertia.

Table C. Variance Decomposition of CPI[1]

Sample	NEXR	INTRATE	BM	CPI Error	Standard
1990:01 – 2001:12	34.85	3.03	9.40	52.72	0.019
1990:01 – 1995:12	33.69	2.23	8.94	55.13	0.025
1996:01 – 2001:12	9.58	1.83	6.71	81.87	0.012

[1]Six months after an initial shock to the nominal exchange rate.

5.2 Responses of CPI Excluding Agriculture

By excluding agriculture prices, the behaviour of the pass-through changed when compared to the original CPI. The impact of a shock to the exchange rate was smaller, but the pass-through much faster and of a higher degree than in the post 1995 period. This probably reflects the fact that the import component of the sub-categories in the CPI, excluding agriculture prices, was significant.[23] Therefore, there is a more direct pass-through when agriculture prices are excluded from the CPI. The results of the cointegrating relationship show that the long-run pass-through dynamics are smaller when agriculture prices are excluded. Figures C and D below show the extent of the pass-through. Table D below summarizes the responses of the CPIAG to a 1.0 per cent shock to the nominal exchange rate after 3, 6, 9 and 12 months for the two sub-samples. Tables 6 to 7 in the Appendix report the detailed results of the cointegration tests and impulse responses.

Table D. Effect of CPIAG to a 1% – Exchange Rate Shock – VEC

Sample	After 3 months	After 6 months	After 9 months	After 12 months
1990:01 – 1995:12	0.414	0.666	0.839	0.933
1996:01 – 2001:12	0.363	0.570	0.706	0.802

23 Data availability precludes an analysis of the import component.

Figure C. Response of CPIAG to a 1% Depreciation
1990 - 1995

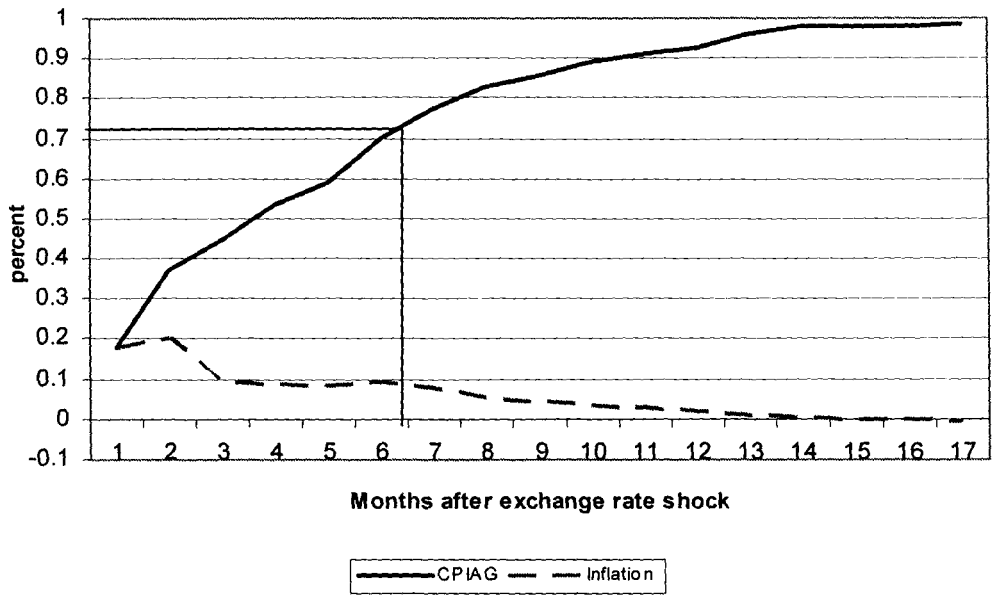
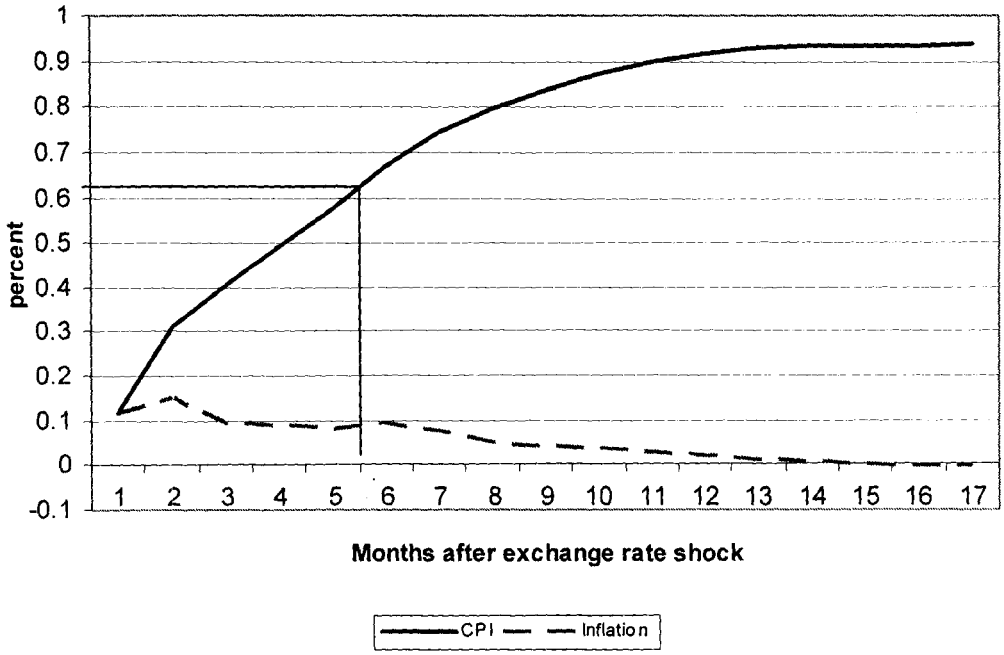


Figure D. Response of CPI to a 1% Depreciation
1990 - 1995



6.0 Conclusion

The exchange rate in Jamaica is one of the most important determinants of inflation and a key element in the monetary transmission mechanism. This paper analyzed the effects of exchange rate fluctuations on the consumer price index. The evidence presented indicates that the inflationary impact of exchange rate depreciation in Jamaica has declined in recent years. Pass-through to the CPI is approximately 80.0 per cent complete six months after an initial shock to the nominal exchange rate for the 1990 to 1995 period. Conversely, the pass-through is less complete at approximately 45.0 per cent in the 1996 to 2001 period, six months after an initial shock to the nominal exchange rate. Excluding agriculture prices the pass-through is approximately 70.0 per cent complete six months after an initial shock to the nominal exchange rate, prior to 1996, while in the 1996 to 2001 period, the pass-through is approximately 60.0 per cent complete six months after an initial shock to the nominal exchange rate. The results indicate that the speed of the pass-through has slowed in the last five years. This trend reflects the combined influence of monetary policy, lower private demand and structural transformations in the Jamaican economy. The dependence of the pass-through on the economic environment arises essentially because the pass-through reflects the expected effect of monetary shocks on current and future costs.

The literature indicates that the exchange rate policy might affect pass-through. It is possible that the exchange rate regime itself may not be the critical factor but that the volatility of the exchange rate matters. Additionally, the literature has indicated that there is an inverse relationship between volatility and pass-through, that is, if volatility were lower then pass-through would be higher. The results in this paper indicate that the pass-through declined in the post 1995 period when exchange rate volatility was lower.

It should be noted, however, that despite the moderation in the pass-through, the results suggest that the influence of exchange rate movements is still significant for inflation. While the lower degree of pass-through allows for some flexibility in policy, continued emphasis has to be placed on reducing volatility and moderating the pace of adjustments. In an open economy that is highly import-dependent, such as Jamaica, the moderation in the pass-through implies that producers and retailers absorbed a greater proportion of the imported inflation. However, there is a limit to the amount of absorption and in a context where income and demand have recovered, suppliers will more readily pass on any increase in imported costs in the future. More importantly, because the exchange rate is an important nominal anchor for expectations, rapid movements in the rate can precipitate an expectation driven wage/inflation spiral and an increase in the rate of pass-through.

References

Bernanke, B.S. and I. Mihov. 1997. "What Does the Bundesbank Target?" *European Economic Review* 41, 1025-1053.

Brook, A. 2001. The Role of the Exchange Rate in New Zealand's Inflation Targeting Regime.

Choudhri, E.U. and D.S. Hakura. 2001. "Exchange Rate Pass-through to Domestic Prices: Does the Inflationary Environment Matter?" *IMF Working Paper* WP/01/194.

Clarida, R., J. Gali and M.Gertler. 1998. "The Science of Monetary Policy: A New Keynesian Perspective", *Journal of Economic Literature* XXXVII, 1661-1707.

Coppel, J., R. Simes, and P. Horn. 1987. "The Current Account in the NIF88 Model: Some Preliminary Results." Paper presented to the 1987 *Conference of Economists*, Surfers Paradise.

DeJong, D.N.J., J. Nankervis, N. Savin, and C. Whiteman. 1989. "Integration versus Trend Stationarity in Macroeconomic Time Series", *Working paper no. 89-99*, Department of Economics, University of Iowa, Iowa City, IA.

Diebold, F.X. and G.D. Rudebusch. 1991. "On the Power of Dickey-Fuller Tests Against Fractional Alternatives", *Economics Letters 35*, 155-160

Dornbush, R. 1987. "Exchange Rates and Prices", *American Economic Review* 77, 93-106.

Engel, C. 2001. The Responsiveness of Consumer Prices to Exchange Rates and the Implication for Exchange Rate Policy: A Survey of a Few New Open-Economy Macro Models, University of Wisconsin and NBER.

Engle, R.F. and C.W.J. Granger. 1987. Cointegration and Error Correction: Representation, Estimation and Testing, *Econometrica*, 49: 1057-1072.

Gerlach, S. and L.E.O. Svensson. 2000. "Money and Inflation in the Euro Area: A Case for Monetary Indicators?" *NBER Working Paper* no. 8025.

Goldberg, P.K. and M.M. Knetter. 1997. "Goods Prices and Exchange Rates: What Have we Learned?" *Journal of Economic Literature* 35 (3), 1243-1272.

Granger, C.W.J and P. Newbold. 1974. "Spurious Regressions in Econometrics", *Journal of Econometrics*, 2:111-120.

Hansen, H. and K. Juselius. 1995. CATS in RATS – Cointegration Analysis of Time Series, Estima, Illinois.

Hobijn, B., P.H. Franses and M. Ooms. 1998. Generalisations of the KPSS-Test for Stationarity, Working Paper No. 9802/A, Econometric Institute, Universität Rotterdam.

Hüfner, F.P. and M. Schröder. 2002. Exchange Rate Pass-through to Consumer Prices: A European Perspective, ZEW Discussion Paper No. 02-20, Mannheim.

Johansen S. 1991. "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models", *Econometrica*, 59.

Kahn, G.A. 1987. "Dollar Depreciation and Inflation", *Federal Reserve Bank of Kansas City Economic Review* 72 (9), 32-49.

Kent, C. 1995. "Exchange Rate Pass-through: Testing the Small Country Assumption for Australia", Econometrics Paper.

Kim, K.H. 1998. "US Inflation and the Dollar Exchange Rate: A Vector Error Correction Model", *Applied Economics* 30 (5), 613-619.

Krugman, P.R. 1987. *Pricing to Market when the Exchange Rate Changes*, in: Arndt, S.W.and J.D. Richardson, Real-financial Linkages Among Open Economics, Cambridge, MA: MIT Press, 49-70.

Kwiatkowski, D., P.C.B. Phillips, P. Schmidt and Y. Shin. 1992. "Testing the Null Hypothesis of Stationarity Against the Alternative of a Unit-root: How Sure are we that Economic Series have a Unit Root?", *Journal of Econometrics* 54, 159-178.

McCarthy, J. 2000. "Pass-through of Exchange Rates and Import Prices to Domestic Inflation in Some Industrialized Economies", *Federal Reserve Bank of New York Staff Reports 111.*

Menon, J. 1991a. "Some Properties on the Relationship between Exchange Rate Pass-through and the Law of One Price in International Trade", *Victoria University of Technology*, Research Paper #10.

Menon, J. 1995. "Exchange Rate Pass-through", *Journal of Economic Surveys* 9 (2), 197-231.

Newey, W.K. and K.D. West. 1994. Automatic Lag Selection in Covariance Matrix Estimation", *Review of Economic Studies* 61, 631-653.

Parsley, D.C. and H.A. Popper. 1998. "Exchange Rates, Domestic Prices, and Central Bank Actions: Recent U.S. Experience", *Southern Economic Journal*, 64 (4), 957-972.

Phillips, R.W. 1988. "The Pass-through of Exchange Rate Changes to Prices of Imported Manufactures", *A.N.U. Center for Economic Policy Research*, Discussion Paper.

Piggot, C. and V. Reinhart. 1985. "The Strong Dollar and U.S. Inflation", *Federal Reserve Bank of New York, Quarterly Review,* 10: 23-29.

Richards, T. and G. Stevens. 1987. "Estimating the Inflationary Effects of Depreciation", *Reserve Bank of Australia Research Discussion Paper No. 8713.*

Robinson, W. 1996. "Forecasting Inflation Using VAR Analysis", *Bank of Jamaica Research Paper.*

Taylor, J.B. 2000. "Low Inflation, Pass-through, and the Pricing Power of Firms", *European Economic Review* 44, 1389-1404.

Appendix - Tables

Table 1. Pairwise Granger Causality Tests

Sample 1990:01 2001:12
Lags: 2

Null Hypothesis	Obs.	F-Statistic	Pro-bability[1]
CPI does not Granger Cause BM	142	4.49	0.0129
BM does not Granger Cause CPI		1.92	0.1502
NEXR does not Granger Cause BM	142	9.10	0.0002
BM does not Granger Cause NEXR		0.50	0.6075
INTRATE does not Granger Cause BM	139	3.26	0.0413
BM does not Granger Cause INTRATE		1.78	0.1727
NEXR does not Granger Cause CPI	142	40.63	1.40E-14
CPI does not Granger Cause NEXR		4.03	0.2000
INTRATE does not Granger Cause CPI	139	1.05	0.3537
CPI does not Granger Cause INTRATE		11.57	2.30E-05
INTRATE does not Granger Cause NEXR	139	3.41	0.036
NEXR does not Granger Cause INTRATE		1.64	0.1978

[1]This denotes the probability that one variable does not Granger-cause the other. The hypothesis of no causation from one variable to another is rejected if a probability of 0.05 or less is obtained.

Table 2a. Results of the Augmented Dickey-Fuller (All Variables in Logs)

Results of the Unit Root Tests

1990:01 - 2001:12	Optimal Lag[1]	D-F with Constant[2]	D-F with Trend[2]	Degree of Integration[3]
CPI[4]	2	-3.07*	1.68*	I(2)
BM	10	-3.09*	-1.27**	I(1)
NEXR	9	-3.69*	-2.50**	I(1)
INTRATE	1	2.32*	3.39*	I(1)?

[1]Optimal lag according to the automatic lag selection procedure developed in Schwartz Info. Criterion.

[2]D-F test statistic and significance level: * = 1%, ** = 5%.

[3]I(0) = alternative hypothesis, I(1) = null hypothesis. The result is I(0) if both tests reject the null.

Table 2b. Results of the KPSS-Test (All Variables in Logs)

Results of the Unit Root Tests

1990:01 - 2001:12	Optimal Lag[1]	KPSS with Constant[2]	KPSS with Trend[2]	Degree of Integration[3]
CPI[4]	10	1.23*	0.35*	I(1)
BM	10	1.23*	0.35**	I(1)
NEXR	9	1.06*	0.29**	I(1)
INTRATE	9	0.89*	0.33*	I(0)?

[1]Optimal lag according to the automatic lag selection procedure developed in Newey/West (1994)

[2]KPSS-test statistic and significance level: * = 1%, ** = 5%.

[3]I(1) = alternative hypothesis, I(0) = null hypothesis. The result is I(1) if both tests reject the null.

Results of Cointegration Tests on Headline Inflation

Results of the Cointegration Tests (Johansen Test)

Table 3a. Test for the Cointegrating Rank - 1990:01 - 2001:12

Ho	λ_i	Trace	Trace 95	Trace 99
r = 0	0.241	66.69	47.21	54.46
r < 1	0.119	28.84	29.68	35.65

Note: The hypothesis r = 0 is strongly rejected, while the second hypothesis is not. (calculated > critical).

Results of the Cointegration Tests (Johansen Test)

Table 3b. Test for the Cointegrating Rank - 1990:01 -1995:12

Ho	λ_i	Trace	Trace 95	Trace 99
r = 0	0.473	68.69	47.21	54.46
r < 1	0.218	24.53	29.68	35.65

Note: The hypothesis r = 0 is strongly rejected, while the second hypothesis is not. (calculated > critical).

Results of the Cointegration Tests (Johansen Test)

Table 3c. Test for the Cointegrating Rank - 1996:01 - 2001:12

Ho	λ_i	Trace	Trace 95	Trace 99
r = 0	0.332	53.30	39.89	45.58
r < 1	0.189	24.21	24.31	29.75

Note: The hypothesis r = 0 is strongly rejected, while the second hypothesis is not. (calculated > critical).

Table 4a. Normalized Estimates[1]
1990:01 - 2001:12

Variable	β	α
CPIJ	1	0.0018 (0.0015)
NEXR	-0.996	-0.0229 (0.0068)
INTRATE	1.485	-0.0364 (0.0152)
BM	1.919	0.0349 (0.0063)

[1]Standard errors for the adjustment coefficients are in parentheses.

Table 4b. Normalized Estimates[1]
1990:01 - 1995:12

Variable	β	α
CPIJ	1	-0.0865 (0.0428)
NEXR	-0.404	-0.0253 (0.2331)
INTRATE	0.025	-0.3688 (0.4516)
BM	0.566	0.9358 (0.1469)

[1]Standard errors for the adjustment coefficients are in parentheses.

Table 4c. Normalized Estimates[1]
1996:01 - 2001:12

Variable	β	α
CPIJ	1	0.0276 (0.0065)
NEXR	-0.982	0.0472 (0.0208)
INTRATE	0.019	-0.0102 (0.0873)
BM	0.633	0.0230 (0.0353)

[1]Standard errors for the adjustment coefficients are in parentheses.

Table 5a. Variance Decomposition of Inflation
1990:01 - 2001:12

Horizon (months)	Variance Due to (%)				Standard Error
	Xrate	Int. rate	Base Money	CPI	
6	34.85	3.03	9.40	52.72	0.019
12	36.32	2.99	9.67	51.01	0.025
18	36.79	2.93	9.69	50.59	0.029
24	37.05	2.89	9.69	50.37	0.033

Table 5b. Variance Decomposition of Inflation
1990:01 - 1995:12

Horizon (months)	Variance Due to (%)				Standard Error
	Xrate	Int. rate	Base Money	CPI	
6	33.69	2.23	8.94	55.13	0.025
12	34.38	2.09	8.88	54.65	0.033
18	34.53	1.97	8.79	54.71	0.039
24	34.62	1.90	8.74	54.74	0.045

Table 5c. Variance Decomposition of Inflation
1996:01 - 2001:12

Horizon (months)	Variance Due to (%)				Standard Error
	Xrate	Int. rate	Base Money	CPI	
6	9.58	1.83	6.71	81.87	0.012
12	10.74	1.74	6.56	80.96	0.016
18	11.08	1.67	6.39	80.86	0.019
24	11.23	1.63	6.29	80.86	0.022

Results of Cointegration Tests on Headline Inflation excluding Agriculture

Results of the Cointegration Tests (Johansen Test)

Table 6a. Test for the Cointegrating Rank
1990:01 - 2001:12

Ho	λ_i	Trace	Trace95	Trace99
r = 0	0.293	84.48	39.89	45.58
r < 1	0.151	35.57	24.31	29.75

Note: The hypothesis r = 0 is strongly rejected, while the second hypothesis is not. (calculated > critical)

Results of the Cointegration Tests (Johansen Test)

Table 6b. Test for the Cointegrating Rank
1990:01 - 1995:12

Ho	λ_i	Trace	Trace95	Trace99
r = 0	0.466	68.40	47.21	54.46
r < 1	0.218	25.13	29.68	35.65

Note: The hypothesis r = 0 is strongly rejected, while the second hypothesis is not. (calculated > critical)

Results of the Cointegration Tests (Johansen Test)

Table 6c. Test for the Cointegrating Rank
1996:01 - 2001:12

H0	λ_i	Trace	Trace95	Trace99
r = 0	0.335	51.80	39.89	45.58
r < 1	0.192	22.40	24.31	29.75

Note: The hypothesis r = 0 is strongly rejected, while the second hypothesis is not. (calculated > critical)

Table 7a. Normalized Estimates[1]
1990:01 - 2001:12

Variable	β	α
CPIAG	1	0.0022 (0.00079)
NEXR	-0.464	-0.0145 (0.00425)
INTRATE	2.685	-0.0282 (0.0094)
BM	-1.409	0.0211 (0.00404)

[1]Standard errors for the adjustment coefficients are in parentheses.

Table 7b. Normalized Estimates[1]
1990:01 - 1995:12

Variable	β	α
CPIAG	1	-0.0892 (0.0434)
NEXR	-0.412	-0.0179 (0.2708)
INTRATE	0.037	-0.4555 (0.5237)
BM	-0.451	1.0468 (0.1734)

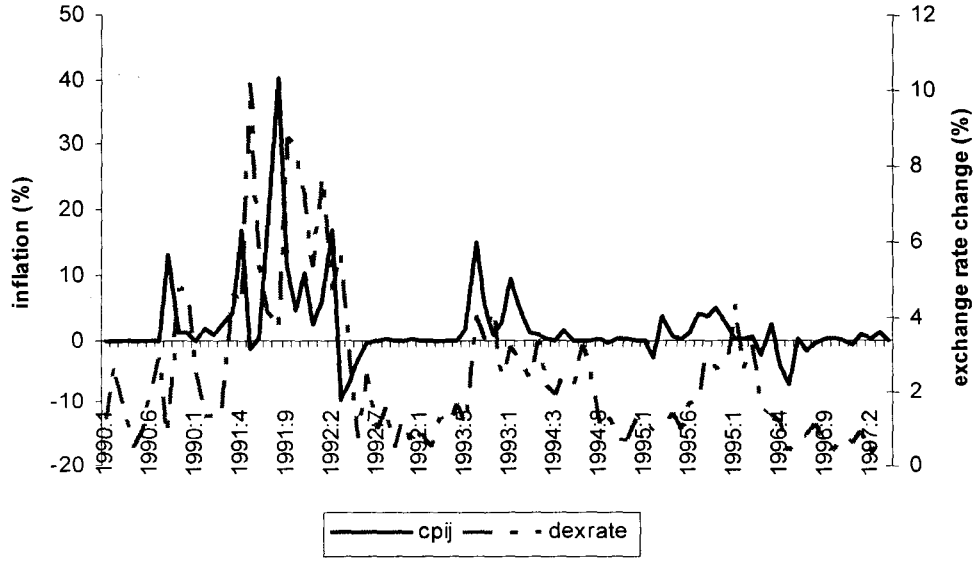
[1]Standard errors for the adjustment coefficients are in parentheses.

Table 7c. Normalized Estimates[1]
1996:01 - 2001:12

Variable	β	α
CPIAG	1	-0.0513 (0.0115)
NEXR	-0.897	0.0903 (0.0486)
INTRATE	0.0724	0.0797 (0.0873)
BM	-0.179	-0.1236 (0.0353)

[1]Standard errors for the adjustment coefficients are in parentheses.

Figure 1: Inflation and Exchange Rate Changes, Q1 1980 - Q4 2001



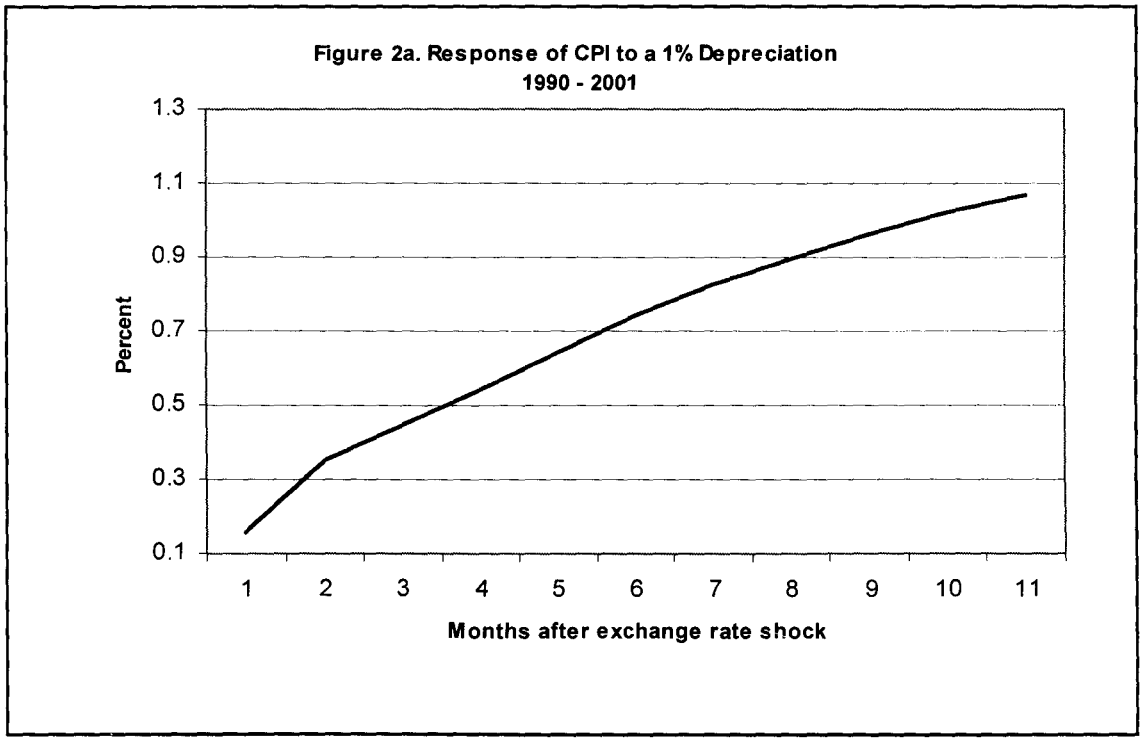


Figure 2a. Response of CPI to a 1% Depreciation
1990 - 2001
1.3
1.1
0.9
0.7
0.5
0.3
0.1
Percent
1 2 3 4 5 6 7 8 9 10 11
Months after exchange rate shock

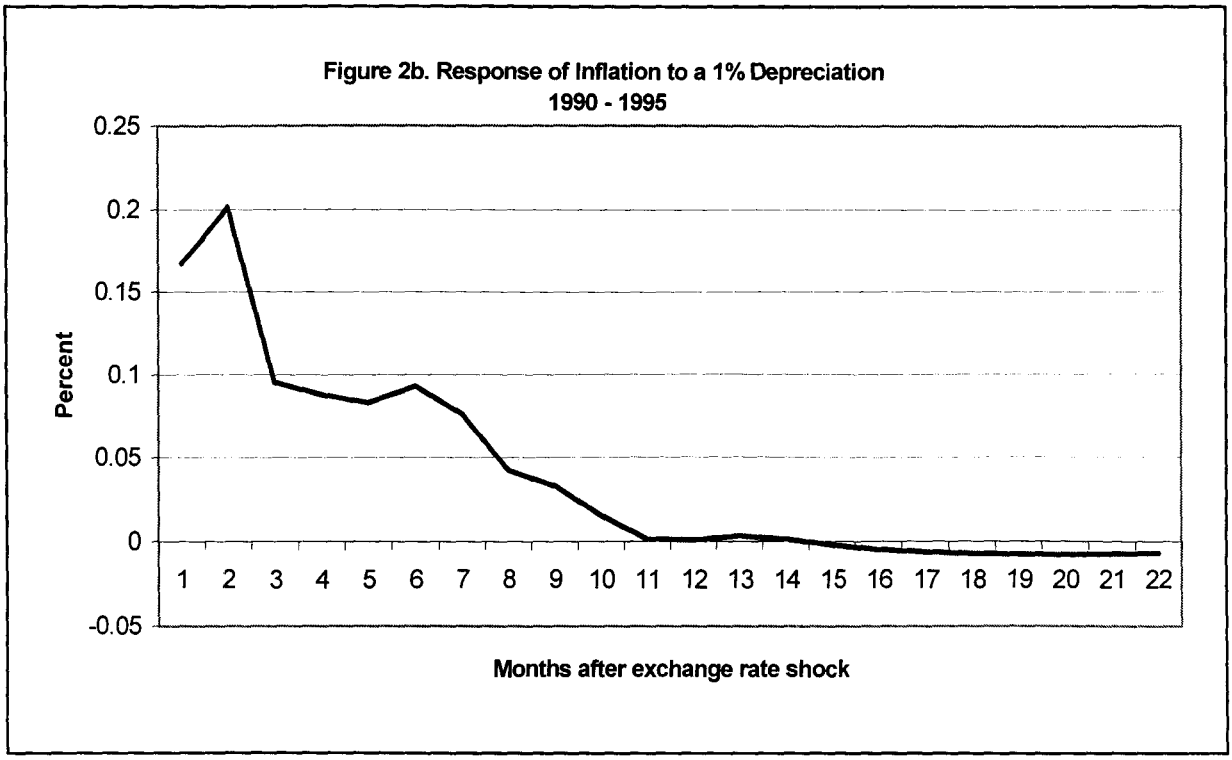


Figure 2b. Response of Inflation to a 1% Depreciation
1990 - 1995
0.25
0.2
0.15
0.1
0.05
0
-0.05
Percent
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
Months after exchange rate shock

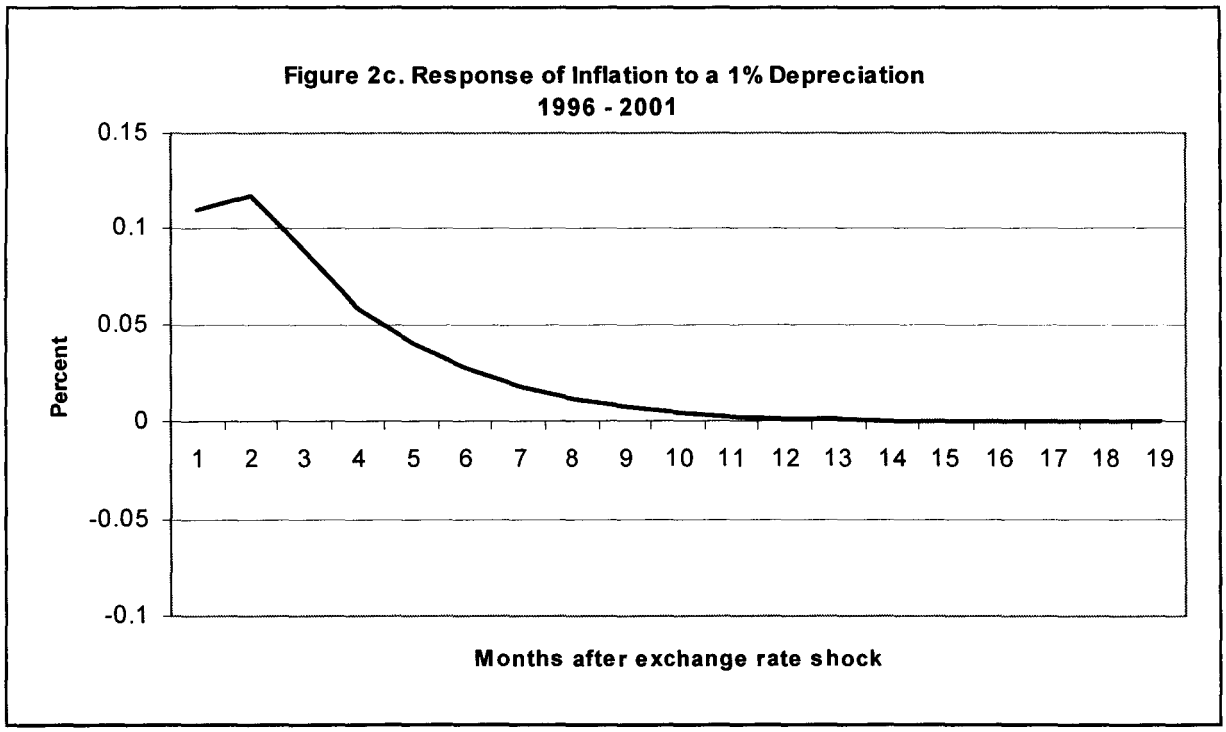


Figure 2c. Response of Inflation to a 1% Depreciation
1996 - 2001
0.15
0.1
0.05
0
-0.05
-0.1
Percent
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Months after exchange rate shock

Figure 3a. Response of CPI Excluding Agriculture to a 1% Depreciation 1990 - 2001

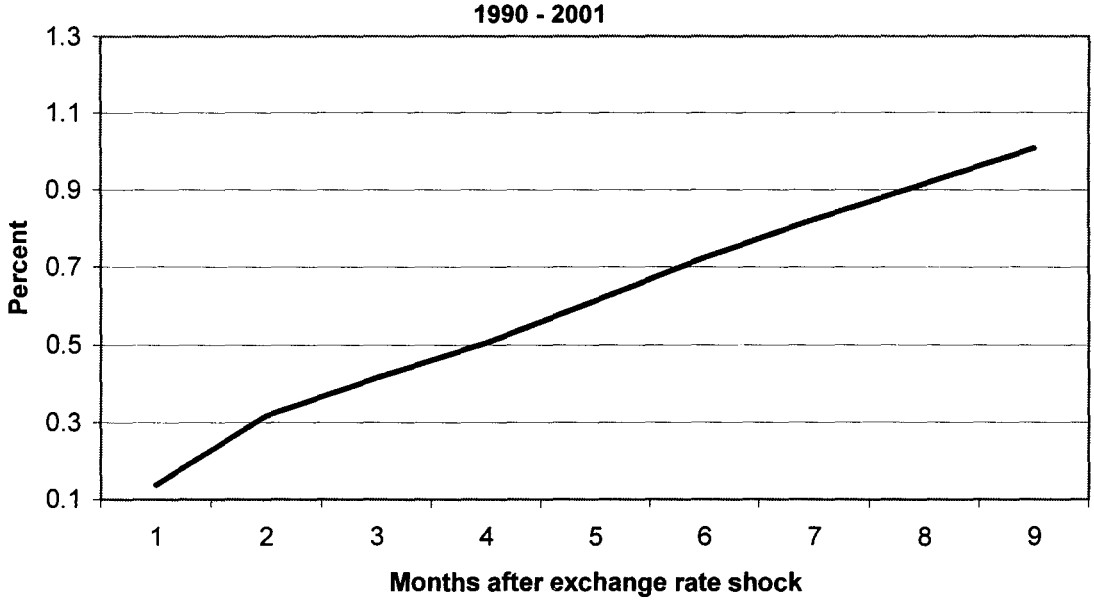
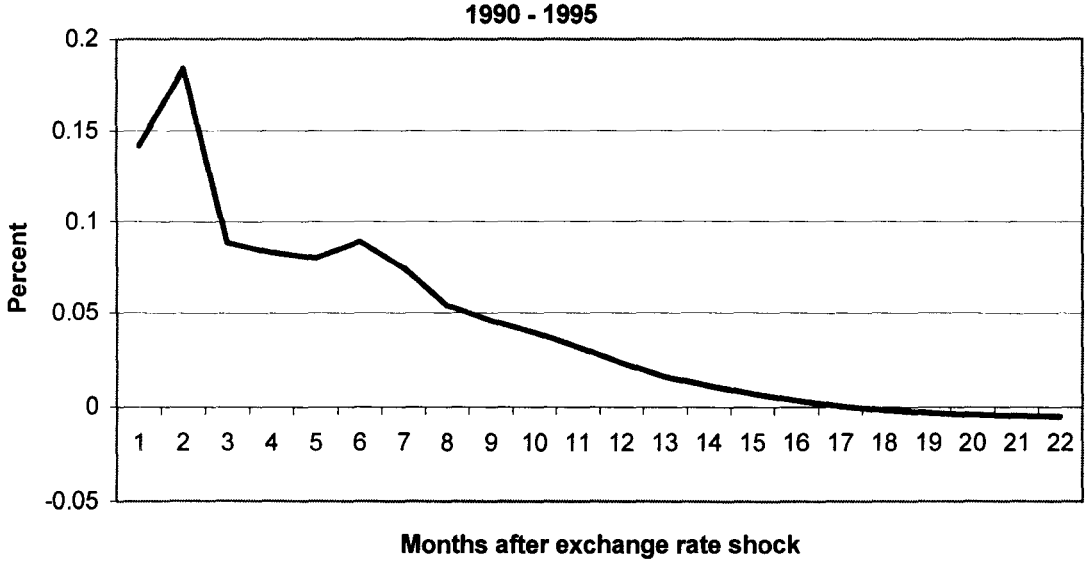


Figure 3b. Response of Inflation Excluding Agriculture to a 1% Depreciation 1990 - 1995



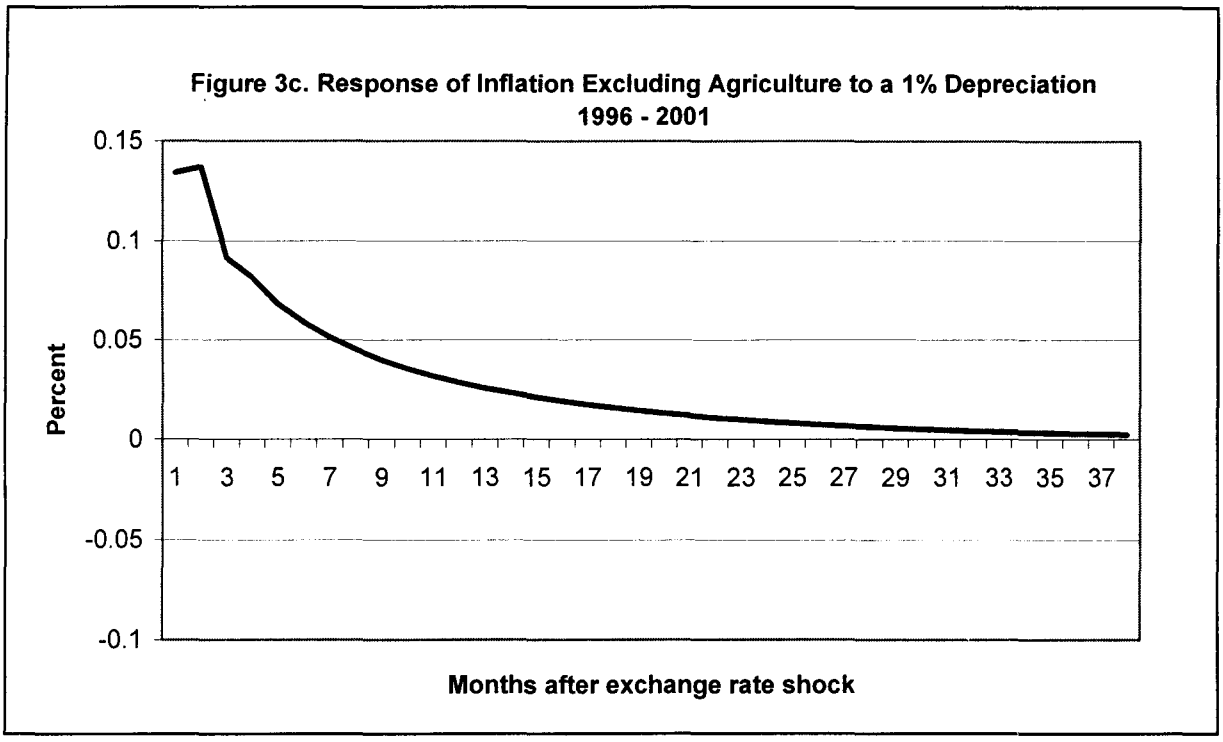


Figure 3c. Response of Inflation Excluding Agriculture to a 1% Depreciation
1996 - 2001
0.15
0.1
0.05
0
-0.05
-0.1
Percent
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37
Months after exchange rate shock

17

Currency Crisis Vulnerability: The Case of the Eastern Caribbean Currency Union

Karen P. Williams & Natasha N. Marquez[1]

Abstract

This paper will address the development of a framework for studying a currency crisis associated with inconsistency between fiscal policy fundamentals and a fixed exchange rate. It seeks to review the evolution of several indicators over a 10-year period for member countries of the Eastern Caribbean Currency Union (ECCU) and discuss whether the existing trend points to an impending crisis. The role of fiscal policy under a fixed exchange rate system is examined, highlighting the contribution of fiscal policy management in generating a currency crisis. The discussion suggests a link between fiscal sustainability and currency crises, which has implications for ECCU member countries.

1. Introduction

The 1990's have witnessed three major currency crises: the European crisis of 1992/93, the Latin American of 1994/95 and the East Asian of 1997/98. These events have prompted mounting studies of crises. Theorists have looked for possible causes and feasible explanations for them, while empirical modellers have examined data for crisis predictors or indicators. There are three genres of models on currency crises in economic literature.

---

1 The authors are employed as economists in the Research Department of the Eastern Caribbean Central Bank (ECCB). They would like to thank Kent Vital for his comments and Cheryl Fletcher for her excellent editorial assistance. The opinions expressed in the paper are those of the authors and should not be interpreted as representing the views of the institution.

The earliest works, now called first-generation models, emphasise that under a fixed exchange rate system, weak fundamentals such as expansionary fiscal and monetary policies result in a persistent loss of international reserves and ultimately lead to an attack on the currency. This attack that occurs with investors trying to profit, ultimately forces the authorities to abandon the parity thereby pushing the economy into crisis (Krugman, 1979; Flood and Garber, 1984). Under this model, the level of international reserves, growth in domestic credit relative to money demand, fiscal imbalances and excessive credit to the public sector could serve as indicators of an approaching crisis.

More recent models, such as the second-generation model (Obstfeld, 1994), suggest that a crisis results from changes in other variables; it stresses the trade-off between the fixed exchange rate system and other policy objectives (low domestic interest rates, unemployment and growth). These models seem to highlight the possibility that crises are self-fulfilling. Based on these models, the evolution of output and domestic and foreign interest rates may be useful indicators of currency crises.

Finally, third generation models focus on the features of the financial system. They address issues relating to the balance sheets of the banks and emphasise the role of financial fragility in generating the currency crisis.

These theoretical works have given modellers the fundamentals/variables to use in their empirical studies as they seek to determine potential predictors. Kaminsky-Lizondo-Reinhart (1997) grouped these studies into four broad categories:

i. papers that provide only a qualitative discussion of the causes and developments leading to the currency crisis;

ii. those that examine the stylised facts of the period leading up to, and immediately following, the currency crisis;

iii. those that estimate the probability of devaluation one or several periods ahead, usually on the basis of an explicit theoretical model;

iv. those that present a nonparametric approach for evaluating the usefulness of several variables in signalling an impending crisis.

Most of these studies have focussed on industrialised, emerging markets and the larger developing countries. There is very little on small island economies, particularly the Caribbean. It is our intention to examine the macroeconomic fundamentals for the Eastern Caribbean Currency Union (ECCU)[2] over the last 10 years in an effort to determine its vulnerability. The members of the ECCU have followed the policy of determining an official exchange rate for the Eastern

---

2 ECCU members comprise Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines. They are served by a common central bank, the Eastern Caribbean Central Bank (ECCB) under a fixed exchange rate system.

Caribbean (EC) dollar. From 1976 the E.C. dollar has been pegged to the US dollar at $2.70. The Eastern Caribbean Central Bank (ECCB) views as crucial the external policy objective of maintaining the exchange rate peg. It has been argued that a fixed exchange rate contributes to low domestic inflation and to low and stable rate of money growth. Ultimately the questions to be answered are:

- How vulnerable is the ECCU to a currency crisis?
- What type of shock could force the ECCB and the member governments to deviate from the declared parity?
- Can the fiscal situation of the currency union as a whole or even that of some of its members result in a threat to or collapse of the fixed exchange rate system?
- Can unsustainable fiscal deficits trigger a banking crisis that could lead to a devaluation and result in a currency crisis?

This paper will address the development of a framework for studying a currency crisis associated with a fiscal imbalance. Our foremost concern will be to understand the relationship between currency crises and fiscal sustainability. Section II of the paper reviews the theoretical literature, identifying a set of vulner-ability indicators of a currency crisis, concentrating to a large extent on its relationship to fiscal sustainability. Section III examines the fundamentals for the ECCU and reports on the patterns in the identified variables. Finally, Section IV will provide a synopsis of the findings and highlight the relevant conclusions as they relate to improving the domestic financial system and recognising the warning signals of a currency crisis. Some shortcomings of our analysis will be discussed and areas for expanding the research will be identified.

2. Literature Review

A review of the literature on crises over the last few years has led to two types of crises being identified: currency crises and financial crises. Economic literature defines a currency crisis as a situation in which an attack on the currency leads to a sharp depreciation in its value, a large decline in international reserves, or a combination of the two. The World Economic Outlook of the IMF defines it as "substantial nominal currency devaluation." A currency crisis involves a sudden movement in the exchange rate and a sharp change in capital flows. A financial crisis, on the other hand, originates in or induces insolvency in the banking system, and features a collapse in asset prices, most often in equity and securities markets.

A number of theoretical pieces have been written on vulnerability to a crisis. Our focus will be on the "vulnerability theory" or first-generation models and on those that suggest fiscal imbalance as an explanation of currency crisis. Athukorala and Warr (2002) cited the Asian currency crisis as a good example of the vulnerability theory as it reflected an unsustainable deterioration in the

macroeconomic conditions within the affected countries. The vulnerability theory accepts that "market over-reaction, triggered by 'manias and panics' may have made the financial collapse more severe" in Asia than was warranted by the macro-economic circumstances of the country at the time of the crisis. In this context vulnerability refers to a country's susceptibility to a currency crisis. Corbitt and Vines (1998) argue that a country's vulnerability to a crisis can be caused by either inadequate macro-economic policies or an inadequately developed financial system. A state of vulnerability by itself does not give rise to a currency crisis; there must be a disturbance or trigger that will push a vulnerable situation into an actual collapse.

According to Athukorala and Warr (2002), a currency crisis occurs when "market participants lose confidence in the currency of a particular country and seek to escape assets denominated in that currency." Investors try to avoid short-term capital losses by exiting from countries where they expect that large nominal value exchange rate depreciation will take place. The concerns governing their actions are the likelihood that the currency would depreciate should capital inflows reverse and the possible magnitude of that depreciation.

Studies of currency crises have revealed that an effective warning system should take into account a variety of indicators, as crises are usually preceded by symptoms that arise in a number of areas. A warning system involves monitoring the evolution of these indicators monthly; every time a variable exceeds a certain ceiling this is viewed as a 'signal' that a crisis may occur within a specified period. Following on the arguments of a number of theorists including Athukorala and Warr (2002) and Corbett and Vines (1998), we will focus on the following four key indicators that may be useful in assessing vulnerability:

- Adequacy of reserves
- Financial sector fragility
- Real exchange rate misalignment
- Macroeconomic conditions

Adequacy of Reserves

As one of the key indicators of a country's vulner-ability to a currency crisis, reserve adequacy involves an examination of a number of balance of payments issues for countries with fixed or adjustable peg exchange rates. The conventional yardstick of this indicator is what is usually referred to as the import cover ratio. Basically this ratio looks at the amount of reserves it would take to facilitate one month's worth of imports. However, in his 1995 paper Calvo discredited the use of this ratio as an adequate measure of vulnerability since he noted that a "run against a currency is not usually accompanied by an import spree." Instead, vulnerability to a currency crisis should be linked to reserve levels in relation to mobile capital. The appropriate level of reserves should depend on the volume of all short-term external liabilities and not just the import bill, since they are the liabilities that can most severely affect the strength of the currency if investors decide to bail out.

In line with this trend of thought, another indicator of a country's ability to withstand speculative capital outflows is the maturity structure of the outstanding external debt. A country with a large component of its external debt in short-term liabilities would need to frequently roll over that debt and will face difficulty in defending the currency in the event of a massive outflow caused by panic within the system. In contrast, a country with a debt structure characterised by a small portion of short-term debt has more time to reverse its policy errors. As Athukorala and Warr (2002) point out 'such a country does not need constant access to capital markets to service its debt'. It is able to plan and stage its recovery by reviewing its policies and taking corrective action.

The difficulties presented by using the debt maturity structure indicator are two-fold. In the first instance data on the maturity structure of a country's debt seldom capture portfolio inflows, which form an important part of volatile capital. Secondly, according to Athukorala and Warr (2002), as it relates to vulnerability what is important is the volume of short- term capital in relation to the stock of reserves. A country with a large external debt stock could have very few short-term liabilities in its portfolio yet the enormity of the debt stock in relation to the reserves may be quite significant.

Financial Sector Fragility

The second main area that is considered in relation to the impending potential for a currency crisis has to do with the health of the banking sector, which forms the cornerstone of the financial system. One of the conventional indicators of the soundness of the banking system is the non-performing credit ratio. This ratio is an indicator of the proportion of the bank's credit in terms of loan resources that generate negative returns for the institution. If several banks in a country have high levels of non-performing loans that occupy the greater proportion of their loan portfolio, failure of the banking system can become a reality. However, two main limitations arise in relation to this indicator. First it focuses on historical data and second, measurement errors on account of the vagueness of statistical definitions may occur when conducting the supervisory exercise.

A more popular indicator of the soundness of the banking system is the private sector leverage ratio, which is the level of domestic credit to the private sector as a percentage of the gross domestic product at market prices. Athukorala and Warr (2002) clarify the underlying hypothesis for this indicator as it relates to a country's vulnerability to a crisis and argue that "countries with a rapid build-up in bank credit would have more fragile banking systems, higher non-performing credit ratios and more vulnerability to a crisis."

Real Exchange Rate Developments

The alignment of the exchange rate itself can serve as a proxy for the vulnerability of a country to a currency crisis. The real exchange rate (RER) is the price of the country's traded goods relative to that of its non-traded goods. The real exchange rate has always been proxied by available prices of domestic and foreign goods or import and export prices in some cases. Several different methods have been used in devising an appropriate proxy. One of the popular

methods used to compute the RER is: RER = EP*/P where E denotes the nominal exchange rate, P* is an index of foreign prices and P is the index of domestic prices.

The real effective exchange rate (REER) is "an artificial index that measures the average change of a country's exchange rate against a number of other currencies during a given period" (Sahely (2001)). The REER is the nominal rate deflated by a similarly weighted average of foreign prices relative to those in the home country. Accordingly, Sahely developed such a proxy for the Eastern Caribbean currency union by constructing a CPI deflated fixed-base REER for St. Lucia. The argument in relation to the exchange rate is that if it costs more for imports than can be made from exports then foreign reserves will have to be depleted in order to facilitate imports.

Terms of Trade

Another indicator that may provide warning signals for a currency crisis is the terms of trade. Mounsey (2002) defines the terms of trade as "the performance of export prices relative to import prices." If the terms of trade are declining, and assuming that prices of imports are relatively inelastic for a small open economy, the implication of declining terms of trade is that as the import bill becomes larger, export earnings may not be able to facilitate the import bill. This in turn will lead to a widening of the current account of the balance of payments, which may have to be financed by depleting foreign reserves in a situation of declining capital flows.

Macro-Economic Conditions

First generation models follow from Krugman's seminal work of 1979. These models suggest that crises are reflective of unsustainable macroeconomic conditions within the economy of the affected country. Such unsustainable economic policies could include overly expansionary monetary and fiscal policies, excessive debt accumulation and declining competitiveness. These conditions make an economy susceptible to a currency crisis, and any trigger can push the economy into collapse. Triggers could come from weakness in the financial structure or external conditions. The ability of the central bank to postpone any deviation from the parity will depend on the volume of its foreign exchange reserves.

Macroeconomic imbalances have often been at the root of foreign exchange market crises. The experiences of a number of Latin American countries have clearly shown that unsustainable large current account deficits can bring about sudden reversal in capital flows and consistent with the "panic theory" result in sharp changes in the exchange rate. While external factors may influence or precipitate a crisis, a country's vulnerability to a currency crisis will, to a large extent, depend on its domestic economic conditions and policies, such as excessive borrowing for unproductive uses.

The role of macroeconomic instability in many financial crises has become increasingly apparent. In many cases overly expansionary monetary and fiscal policies have encouraged lending booms and excessive debt accumulation. The

resulting tightening of fiscal policy to alleviate inflationary pressures and assist in the adjustment of external positions has led to a slowdown in economic activity, debt servicing difficulties and rising levels of non-performing loans that threaten banks' solvency. In many Latin American and other developing countries, macroeconomic instability has played an important role in creating financial sector vulnerability. It has also been seen as an underlying factor in most of the banking crises experienced by industrial countries in the post-war period.

The Argentine crisis provides a lucid example of the role that macroeconomic imbalances can play in creating a currency crisis. Nicholls (2002) argues that difficulties in maintaining fiscal discipline appear to have been among the main contributing factors to the development of the crisis in Argentina. The expansionary fiscal stance of the state was reflected in the growth of the average fiscal deficit from an average 1.0 per cent of GDP in 1994/1995 to approximately 3.0 per cent of GDP in 1999. Further, public sector expenditure continued to increase and the overall deficit moved from an average of 0.7 per cent between 1990 and 1995 to 3.0 per cent in 1999.

Theoretically an expansionary fiscal policy will result in fiscal imbalances which have to be financed by domestic credit creation. If the central bank were to be the source of financing for these imbalances this would eventually lead to a depletion of its international reserves. Subsequently, as investors attack the exchange rate, domestic prices would rise, resulting in the appreciation of the real exchange rate and the deterioration of the external current account. Corbett and Vines (1998) argue further that the inflexibility of monetary policy imposed by a fixed exchange rate in circumstances when an economy is booming can be particularly dangerous if fiscal policy is not contracting sufficiently.

According to Nicholls et al (2001), fiscal performance is judged on the basis of sustainability, which can be defined as the ability of the fiscal authorities to maintain a constant debt to GDP ratio over time. The sustainability of the public sector's fiscal policy package is measured as the difference between the path of the actual primary surplus and the path of the calculated primary surplus required for sustainability. The size of the required primary surplus determines the proportion of output that must be taken from other uses to service debt obligations, and thereby maintain public sector sus-tainability. If the difference is positive, meaning that the actual surplus is less than the required sustainability balance, then a fiscal adjustment indicated by the difference is required. The evolution of this indicator over time shows whether a country is moving closer or farther from a fiscal sustainability position. An unsustainable fiscal position has implications for a country's ability to purchase foreign exchange to finance its operations.

In the case of Argentina the fiscal deficit was financed primarily from external sources, resulting in a rapid increase in total public sector debt, which increased by 80.7 per cent between 1990 and 1999. The state turned to the central bank for assistance in paying the external debt; however, as the crisis progressed the government, as Nicholls (2002) high-lights, could "print no more money." The government then decided to print bonds which unsuspecting borrowers bought, causing the debt to expand even further. By December 2001, the government announced that it could not meet its debt obligations and would default, stimulating investor bailouts and the largest sovereign debt default in history.

In the ECCU, where there are eight member countries, access to credit from the central bank is different. The ECCB maintains a strict policy of not financing member countries' fiscal deficits. According to Venner and Williams (1995), "the extent to which this is possible is circumscribed by the legal requirements of the Eastern Caribbean Central Bank, to maintain a foreign exchange reserves to demand liabilities ratio of 60.0 percent." In addition, the legal requirements provide that the ECCB's holdings of treasury bills of any member government should not exceed 10.0 per cent of the member's current revenue. Also the requirements advocate that holdings of securities other than treasury bills should not exceed 15.0 percent of its currency in circulation and other demand liabilities. The ECCB temporary advances to a member in any financial year should not exceed 5.0 per cent of that member's average annual recurrent revenue over the three preceding years. A large increase in credit extended to the member governments could reduce the foreign exchange cover and initially have an adverse impact on the balance of payments and reserves in the future. However, as Venner and Williams point out, "there could be a positive impact on the balance of payments and reserves if the projects generate sizeable foreign exchange earnings.

Some of the countries of the currency union have exercised expansionary fiscal policy resulting in higher fiscal deficits and increasing debt burdens. Over the last decade the primary deficit of the currency union has fallen short of the sustainable balance needed to stabilise the debt-to-GDP ratio. In light of the indicators examined above, the susceptibility of the ECCU to a currency crisis therefore requires an in-depth examination of the indicators of vulnerability in relation to the currency union.

3. Vulnerability of the Eccu

For member countries of the ECCU the performance of the external account and the fiscal policy stance are critical. Financial sector fragility is also of interest, particularly the health of indigenous banks, since a currency crisis may originate from weaknesses in the financial system.

The ECCB Agreement (1983) requires that domestic financial policies be consistent with the external policy objective. Firstly, the ECCB has to maintain a foreign exchange reserves to demand liabilities ratio of 60 per cent. Secondly there are statutory limits on the availability of credit to any of the eight member governments. There is therefore a strict limit on the degree of domestic credit creation by the ECCB to ensure that lending to member governments causes no fall in foreign reserves. Moreover, it has been the historical practice for the Central Bank to maintain high foreign asset cover in excess of the 60 per cent minimum. The institutional framework of the ECCB distributes decision-making power equally among members and the unanimity rule applies with regard to the currency peg. Thus any loss of reserves and any trigger for a crisis would be channelled through the commercial banking system as governments seek to finance their budget deficits by expanding domestic credit.

The following sub-section examines patterns in vulnerability variables for the ECCU over the period 1990 to 2001.

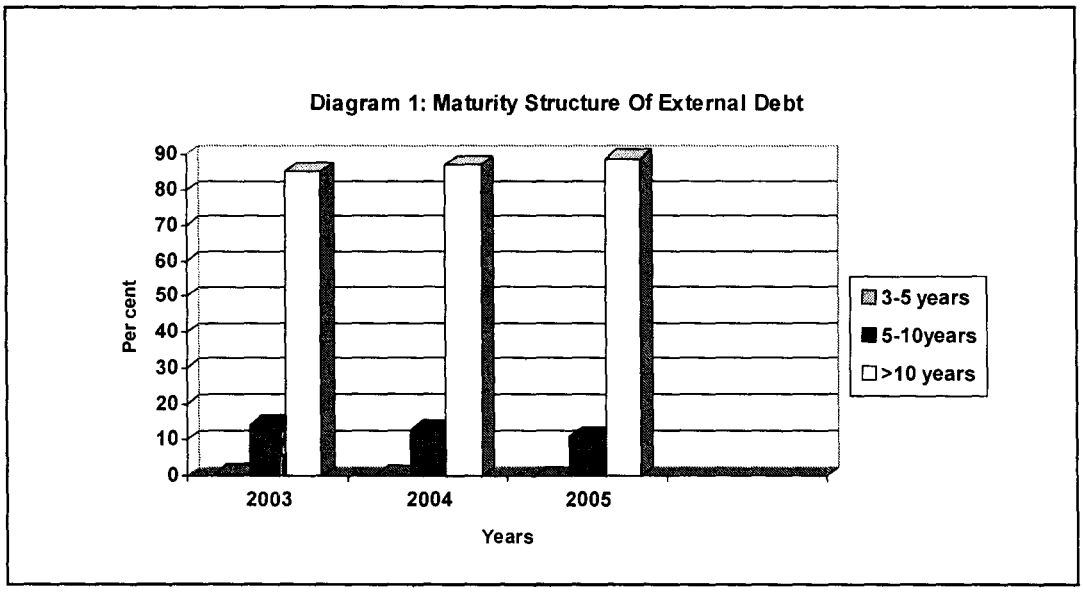
Adequacy of Reserves

Import Cover

A conventional yardstick of reserve adequacy is the import-month equivalent of reserves. A rule of thumb the ECCB adheres to is that official foreign exchange reserves should be equivalent to at least three months' worth of imports. For the period reviewed, 1990 to 2001, the import cover for the ECCU has been well above this benchmark and on an increasing path, with the lowest cover being 4.0 months in 1990 and 1997. This indicates a healthy exchange position since reserves would be able to cover at least four months' worth of imports in the event of foreign exchange difficulties. It is likely that this indicator will remain above the benchmark over the medium term despite an expected increase in import payments associated with rising oil prices and an expansion in construction activity in the ECCU. To maintain a favourable position the region would need to ensure the viability of its tourism industry as the main foreign exchange earner.

Foreign Debt Maturity

The maturity structure of outstanding foreign debt is another indicator of a country's vulnerability to currency crises and a critical element in crisis prevention. An examination of the ECCU's public sector external debt by remaining maturities shows that the region does not have a large stock of short-term external debt. Of the existing debt stock between 2003 and 2005, more than 85.0 per cent matures in over ten years, while approximately 13.0 per cent matures in 5 – 10 years and 2.0 per cent in 3–5 years. Diagram 1 below depicts the case of the ECCU.



Source: ECCB – CSDRMS Debt Database.

It is likely that over the medium term the maturity profile will change, as regional governments contract loans on more commercial terms (with shorter repayment periods). Consequently the proportion of debt falling due within five years and five to ten years is projected to increase, but still remain less than one third of the outstanding debt. However, given the fiscal difficulties faced by some member countries, the focus on fiscal prudence by the Monetary Council of the ECCB and member governments, and the likelihood that member governments will seek to restructure their debt and obtain cheaper debt through the use of the Regional Government Securities Market (RGSM), this indicator is not expected to be adversely affected and trigger a crisis.

External Debt Stock to Reserves

An examination of this external debt stock to reserves ratio for the period 1990 to 2001 indicated that generally the level of external debt has been above the total of net international reserves. On average external debt has been 19.0 per cent higher than net international reserves. But post-1996, external debt has grown at a faster pace relative to the net international reserves, emphasizing further that the reserves are insufficient to cover the level of external debt in the event of foreign exchange difficulties. But this situation would become harmful only if all creditors were to demand repayments at the same time. Assessed on the basis of annual debt service payments vis-à-vis the level of reserves, there is a large measure of comfort, i.e. reserves are adequate. So long as the government can raise the EC dollars to service the debt, then the foreign exchange is available from the pool. Over the medium to long term member governments of the ECCU would need to maintain the focus on improving fiscal balances and managing external debt.

Financial Sector Fragility

Private Sector Leverage Ratio

Unsatisfactory assets and risky investments may accompany rapid credit expansion relative to economic growth within a short time frame. In the currency union, the ratio of outstanding credit to GDP has been consistently above 50.0 per cent in the period reviewed, except in 1990. The ratio moved from 48.9 per cent in 1990 to 77.8 per cent in 2001. Though the growth has been consistent, it has not been particularly rapid. Nonetheless, closer analysis of the data revealed that growth in private sector credit has outpaced that of total output of goods and services. Moreover, the increase in credit was concentrated in the personal sector, mainly for consumption purposes, implying a low level of domestic investment. This may make it difficult for borrowers to repay, and contribute to weakening the banking system. The growth in private sector credit is likely to continue to outpace the increase in GDP, given the emphasis on increasing the housing stock. However growth in economic activity is projected over the medium term, barring significant external shocks or natural disasters, although at rates still below those of the late 1980s and early 1990s.

Non-performing Credit Ratio

The overall trend in the non-performing credit ratio for the ECCU suggests an improvement in asset quality, as the ratio fell from 16.0 per cent in 1990 to 11.7 per cent in 2000, though it rose to 13.6 per cent in 2001. In spite of this declining trend, the ratio has remained above the benchmark of 10.0 per cent set by the ECCB. The largest proportion of unsatisfactory assets was to be found in the indigenous commercial banks, some of which have been the main domestic creditors to central governments. Twenty of the 42 banks in the ECCU are indigenous banks. These indigenous banks over the last six years had an average non-performing ratio of 19.6 per cent, and accounted for over 70.0 per cent of the total unsatisfactory assets of the banking system. These developments would impact on the overall financial strength of the banking system. It is likely that the non-performing ratio for the banking system may grow over the near-term, given the fiscal difficulties of the public sector and the economic slowdown. But over the next five years it is expected that this ratio would be controlled, given an increasing emphasis on financial sector assessments and the strengthening of the regulatory framework for commercial banks.

Real Exchange Rate Developments

Theoretically a persistent appreciation in the real exchange rate may induce a run on the currency, as it may imply that the central bank is unable to defend the currency in the event of capital outflow, particularly mobile capital such as portfolio investments. The capital market development in the region is limited and most of the capital inflows are in the form of private direct fixed investments in the tourism industry. Therefore the degree of volatility of capital flows is narrow. In cases of exchange rate appreciation, exports prices are increasing thus reducing the foreign exchange earnings capacity of the country. In the latter part of the period under review the real exchange rate for the combined governments of the ECCU appreciated: the index moved from 101.3 in 1994 to 106.3 in 2001. Nevertheless, the level has remained below the ceiling of 110 established by the ECCB. The appreciation of the EC dollar is tied to the strong US dollar, which has increased in value in relation to most currencies, especially the euro. This trend renders the region uncompetitive in terms of its exports or traded commodities, and is likely to contribute to a decline in foreign exchange earnings. It is anticipated that this trend will be reversed, given the doubts on the strength of US economic activity as well as the persistence of its current account deficit. Projections are that the US dollar will depreciate against major currencies over the medium term, the consequences of which will be a fall in the value of the EC dollar. While theoretically this means improved competitiveness, in practice falling volumes of exported traditional crops and a likely slow down in tourism, associated with the fear of terrorism and higher oil prices, will dampen foreign exchange earnings.

Terms of Trade

The terms of trade of ECCU member countries have generally been adverse and deteriorating, as the unit price of imports has risen over the period reviewed, while export prices have fallen. Export performance has been weak as earnings from bananas, sugar and even tourism have declined in recent years. Additionally, prospects are that these economic conditions will continue in the near term and contribute to a further deterioration of the terms of trade, which implies that governments would have to rely more on external debt for foreign exchange or borrow from the domestic banking, thereby depleting foreign reserves. However, it is anticipated that regional governments will intensify their diversification efforts, improve the investment climate to attract foreign direct investment, in particular in the tourism industry, and engage in proper debt management.

Macroeconomic Developments

Following strong growth averaging 7.0 per cent in the 1980s, real growth receded to roughly 3.0 per cent during the 1990s. Economic growth in the currency union contracted during 2001, disrupting the trend of positive growth experienced over the last two decades. Among the factors contributing to the weak performance were the slowdown in the global economy which was compounded by the events of September 11, increased competition in the tourism industry and manufacturing sector, unfavourable weather, crop infestation and uncertainty in the banana industry created by the removal of preferences on the British market, plus hostile acts by other multinational banana companies. Additionally, economic growth slowed as diversification efforts were frustrated by the OECD stance on the offshore financial services sector. Consistent with the economic downturn was the weakened performance of the external sector.

External Sector

In the 1980s and early 1990s a relatively high level of foreign direct investment and foreign currency receipts from exports of goods and services (primarily bananas, sugar and tourism) were used to finance external payments. However, since 1995 capital inflows have fluctuated with the redirection of foreign direct investment to Eastern Europe and export earnings have declined with the passage of a number of hurricanes and the attack on the preferential arrangement for the export of bananas. Over the period the current account deficit of the currency union fluctuated, but followed an upward trend, largely reflecting developments in the merchandise trade account as well as in current transfers. This performance was attributed to a number of factors, including unfavourable weather, particularly hurricanes, the lumpiness of investment activity by the private and public sectors, and external shocks, mainly increases in oil prices, and the September 11 attacks on the US.

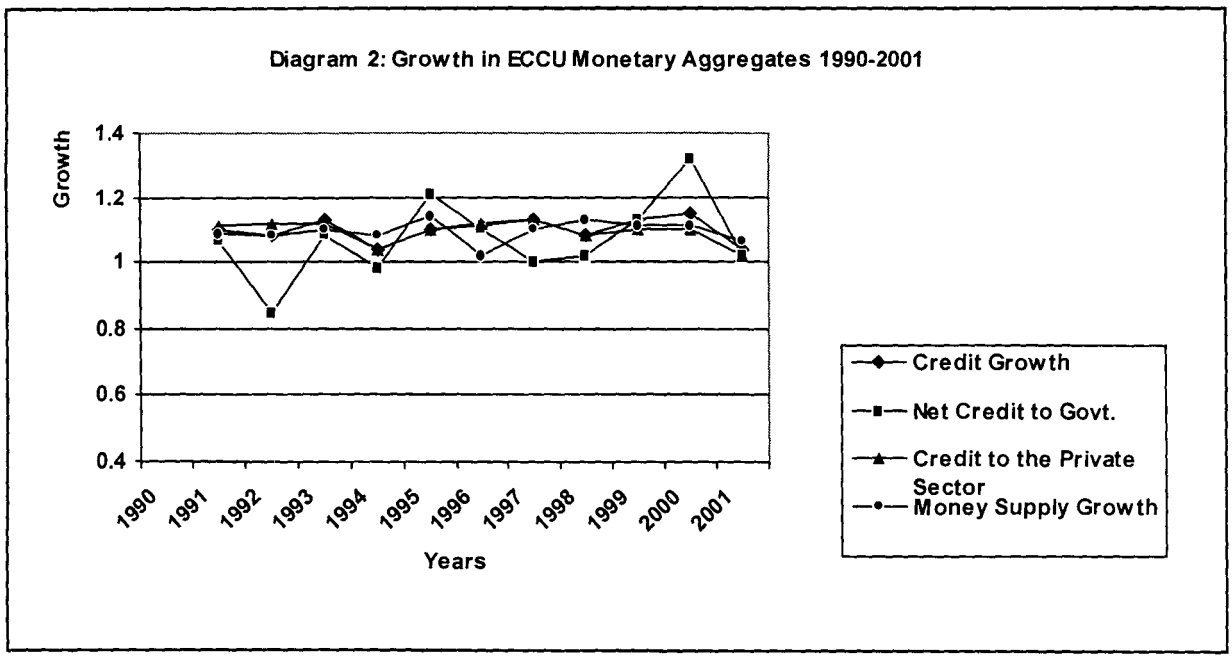
Over the period under review direct investment flows have been relatively erratic, peaking at EC$955.2m, the equivalent of 12.9 per cent of GDP in 1999. In 2001 inflows of foreign direct investment amounted to EC$829.6m, or 10.8 per

cent of GDP, compared with EC$901.8m (11.8 per cent of GDP) in 2000. The decline was partly attributed to the completion of some hotel upgrading and expansion projects. Approximately 80.0 to 85.0 per cent of foreign direct investment projects in the currency union were concentrated in the tourism industry.

Fiscal Sustainability

Notwithstanding the declining trend in real output growth, member governments maintained their expansionary fiscal stance, which contributed to a deterioration of public finances, accumulation of arrears and a reduction in the implementation rate of the PSIP. An examination of the data for the period 1990 to 2001 revealed that the overall balance on the fiscal accounts deteriorated. The fiscal situation of a number of the countries, particularly Antigua and Barbuda, Dominica and St. Kitts and Nevis has worsened, while the surplus in others has contracted. As a percentage of GDP, the combined overall deficit for regional governments was 2.6 per cent in 1990. It fell to 1.4 per cent in 1991 before deteriorating to 6.5 per cent by 2001. Over the same period, the primary deficit averaged 0.3 per cent of GDP. In this scenario, the countries could not have stabilised their debt-to-GDP ratios and were moving away from a sustainable and solvent fiscal path. Member governments have found themselves in greater difficulties in meeting their external payments. To finance their fiscal imbalances, they have resorted to both external and domestic loans, and an accumulation of external arrears.

There has been a trend of increasing debt in the Eastern Caribbean currency union. At the end of December 2001 the total outstanding external public sector debt stood at approximately $3.0 billion. The expansion has generally been in relation to loans to the central governments to facilitate infrastructural development. The disbursed outstanding debt to GDP ratio rose from an average



of 64.1 per cent in the period 1990 to 1997 to 79.4 per cent in 2001. At the same time, domestic debt grew to 30.4 per cent of GDP from 19.9 per cent in 1990. Below we will discuss further the rate of domestic credit creation and in particular credit to the public sector. Diagram 2 below shows the growth in the monetary aggregates for the ECCU between 1990 and 2001.

The trend in credit growth, as seen in the above graph, followed an upward path during the period 1994 to 2000. The absolute value increased to $6,033.3m in 2001 from $2,169.7m in 1990. The driving force behind this credit expansion has been growth in net credit to the central government as non-financial public enterprises are generally net depositors. At the end of 2001 combined net credit to the central government amounted to $697.5m compared to $358.0m in 1990. At the same time, growth in the money supply has been slightly below that of domestic credit, indicating tight liquidity and the drawing down of foreign assets by the commercial banks to meet the credit demand.

In proportion to the expansion in public sector debt, debt-service payments also rose. Over the period 1990-97 interest payments averaged 3.5 per cent of GDP, whilst by 2001 they averaged 3.9 per cent of GDP. The deterioration in the fiscal accounts and the rising debt levels could place additional pressure on the banking system. The example of the West Africa Monetary Union (WAMU) and its subsequent devaluation of the CFA franc have been highlighted in economic literature as being due to "profligate fiscal policies."[3] Consequently, rising debts and the excessive fiscal imbalances of some ECCU member countries could raise alarm bells. There are no statutory constraints, though the Monetary Council of the ECCB has recommended certain prudential guidelines for levels of fiscal deficits. These guidelines include quantitative targets as well as structural reforms designed to improve the fiscal performance. The benchmarks are as follows:

- central government surplus of 4 – 6 per cent of GDP
- overall central government deficit ≤3 per cent of GDP
- total debt ≤60 per cent of GDP
- debt service payments ≤15 per cent of GDP

While the member countries are unlikely to meet those benchmarks by 2007, the date set by the Monetary Council, there will be a movement towards convergence.

---

3 Nicholls *et. al.*, (2001).

4. Recommendations and Conclusions

An analysis of the situation highlights several warning signs that should not be ignored if a currency crisis is to be avoided. The main concern for the ECCU member countries in relation to a currency crisis stems from their fiscal situation. A number of the member countries have unfavourable macroeconomic conditions, growing fiscal deficits and increasing debt burdens. However, each member country has responsibility for the management of its fiscal accounts. The scope for spillover effects in light of the current fractionalisation of the financial space is limited. If the single financial space becomes a reality this may change. A lack of fiscal sustainability as evidenced by these fiscal imbalances and indebtedness (Nicholls *et al* (2001)) or hidden contingent liabilities can precipitate a crisis. Governments would need to signal their intentions to address these situations, possibly through the adoption of fiscal policy rules such as those mentioned above.

The strength of the EC dollar has its roots in the institutional arrangements and legal policy guidelines that govern the Eastern Caribbean currency union. The strong dollar policy of the ECCB ensures that the backing ratio is well above the prudential limit and that the EC dollar is not susceptible to a crisis on account of financing government expenses. In essence the reserves position of the Central Bank seems to be good, but fiscal and debt problems may impact on the banking system and could in the long run result in some difficulties. The countries should move toward implementing structural adjustment programmes as recommended by the Monetary Council of the ECCB with technical assistance from the Caribbean Regional Technical Assistance Centre (CARTAC), in an attempt to stabilise their fiscal positions and ensure long-term sustainability.

The currency crises of the 1990s have pointed to the fragility of fixed exchange rate regimes without adequate reserves. Not all crises are the same and not all arise from the behaviour of indisciplined governments. However, by putting appropriate policies and structures in place, a country is more likely to avert a crises. Research points to a number of such measures that can be implemented including:

- monitoring indicators of vulnerability on a more systematic basis
- getting the fiscal fundamentals right as a necessary condition for the success of a fixed exchange rate system
- keeping macroeconomic fundamentals in line
- putting in place an appropriate institutional structure to regulate the banking system
- improving policies for debt management

The scope of the analysis in this paper does not extend beyond an examination of indicators of vulnerability to a currency crisis. An in-depth analysis of the mobility of capital, the health of the indigenous commercial banks and the likelihood of a financial crisis will be undertaken in future work. Additionally, it

may be interesting to look at the hypothetical case of separate central banks for each member country and develop a time of collapse model.

Bibliography

Athukorala P and P. Warr. 2002. "Vulnerability to A Currency Crisis: Lessons from the Asian Experience", *The World Economy,* Volume 25 No.1, January 2002.

Burnside C., M. Eichenbaum and S. Rebelo. 1999. "Prospective Deficits and The Asian Currency Crisis", The World Bank, 1999.

Calvo G. 1995. "Varieties of Capital Market Crises", University of Maryland, Working Paper.

Caprio G. 1998. "Banking On Crises: Expensive Lessons From Recent Financial Crises", Development Research Group, The World Bank, June 1998.

Corbett J. and D. Vines. 1998, "Asian Currency and Financial Crises: Lessons from Vulnerability, Crisis and Collapse", *The World Economy,* Volume 22 No. 2, March 1998.

Corsetti G. 2000. "Nominal Debt and The Dynamics of Currency Crises", Yale University, Economic Growth Centre, Discussion Paper No. 820, October 2000.

Daniel, B. 1997. "Fiscal Policy and The Predictability of Exchange Rate Collapse", IMF Working Papers, WP/97/133, October 1997.

Daniel B. 1999. "A Fiscal Theory of Currency Crises", University of Albany, December 1999.

Denircuc-Kunt A. and E. Detragiache. 1998. "The Determinants of Banking Crises in Developing and Developed Countries", IMF Staff Papers, Volume No.45 No. 1, March 1998.

Flood, R. and N. Marion. 1998. "Perspectives on the Recent Currency Crisis Literature", IMF Working Papers, WP/98/130, September 1998 .

Goldafajn I., and R. Valdes. 1997. "Are Currency Crises Predictable?" IMF Working Papers, December 1997.

Kaminsky G., Lizondo S. and C. Reinhart. 1997. "Leading Indicators of Currency Crises", IMF Working Papers, WP/97/79, July 1997.

Kin D. 1999. "How Much did Excess Debt Contribute to the 1997 Currency Crisis in Korea?" Queen Mary and Westfield College University of London, Working Paper #407, July 1999.

Mishkin F. 1996. "Understanding Financial Crises: A Developing Country Crises", Annual World Bank Conference on Development Economics 1996, The World Bank, 29-62.

Mounsey A. 2002. "Indicators of Competitiveness in the Eastern Caribbean Currency Union: The Case of St. Lucia", ECCB, 2002.

Nicholls G, K. Vital and K. Williams. 2001. "Fiscal Performance of the Eastern Caribbean Currency Union: Is There a Case for Fiscal Rules?" ECCU Monetary Council, 2001.

Obstfeld, M. 1994. "The Logic of Currency Crises", NBER Working Paper No. 4640, February 1994.

Reisen H. 1998. "Domestic Causes of Currency Crises", OECD Development Centre, Technical Papers #136, June 1998.

Sahely L. 2001. "Documentation on the Construction of the Real Effective Exchange Rate Index", Eastern Caribbean Central Bank, October 2001.

Venner J. and A. Williams. 1995. "Substitution of External Debt with Domestic Debt in the ECCB Region", Eastern Caribbean Central Bank Report and Statement of Accounts.

Weber A. 1997. "Sources of Currency Crises: An Empirical Analysis", Universitat Bonn and CEPR, Discussion Paper #418, November 1997.

World Economic Outlook. 1998. "Financial Crises: Characteristics and Indicators of Vulnerability", IMF, 1998.

Worrell D., D. Marshall and N. Smith. 1999. "The Political Economy of the Exchange Rate Policy in the Caribbean", IMF, July 1999.

18

Estimates of the Long-Run Equilibrium Exchange Rate in Selected Caribbean Countries

Winston Moore, Ryan Skeete and Kevin Greenidge

Abstract

This paper investigates whether the real effective exchange rates (REER) for Barbados, Jamaica and Trinidad and Tobago over the period 1970-2001 are over or under their equilibrium values. A long-run cointegrating regression of the REER and five fundamental variables is obtained, and the degree of over- or under-valuation is obtained by comparing the actual REER to the equilibrium REER value. The paper finds that the actual REER for Barbados and Jamaica are currently above the equilibrium REER, while Trinidad and Tobago's REER is below the level it would have been in equilibrium.

1. Introduction

The equilibrium Real Effective Exchange Rate (REER) is the rate that achieves internal as well as external balance. It is generally accepted in the literature that maintaining the correct REER promotes economic welfare, while maintaining the real exchange rate at the "incorrect" level (a value considerably different from its long-run equilibrium) reduces a country's welfare. This occurs since disequilibrium gaps send incorrect signals to economic agents, and thereby result in greater economic instability.

There are two main approaches used to derive the equilibrium REER – the fundamental equilibrium exchange rate (FEER) approach, and the behavioural equilibrium exchange rate (BEER) technique. The FEER framework, popularised by Williamson (1994), attempts to derive a REER that is consistent with internal (full employment) as well as external (a sustainable current account position) equilibrium. The degree of exchange rate misalignment is, therefore, calculated as the difference between the actual REER, and the FEER derived from sustainable values of the fundamental variables. In contrast, the BEER approach first estimates a long run behavioural model of the REER, and then calculates the

degree of exchange rate misalignment as the difference between the actual and the predicted REER, based on the current values of the fundamental variables (see Clark and MacDonald, 2000). In this study, the BEER approach is employed since the calculation of the FEER is usually quite difficult to implement in practice, given that it requires the researcher to make normative judgements about the desirable values of the fundamental variables (for a comparison of both approaches see Clark and MacDonald, 1998).

The fundamentals are those real variables that play a key role in the determination of the country's internal and long-run sustainable external position. Although the equilibrium real exchange rate is a function of real variables only, the actual real exchange rate responds both to real and monetary variables. Therefore, the actual real rate does not have to be always equal to its equilibrium value. Indeed, it will often depart from its steady state in the short run due to temporary changes in real variables or economic shocks (eg. a spike in oil prices). However, other types of deviations, such as the adoption of monetary and fiscal policies that are inconsistent with the chosen nominal exchange rate regime, can generate large and persistent differences between actual and equilibrium real exchange rates. These large departures are referred to as misalignment of the real exchange rate (see MacDonald, 1997; Edwards, 1987).

The purpose of this paper is to assess whether the real effective exchange rates (REER) for Barbados, Jamaica and Trinidad and Tobago are misaligned. This analysis comes against the backdrop of a recent agreement for monetary union with the Caribbean Community and Common Market (CARICOM)[1] (see Farrell and Worrell, 1994 for further details). One of the criteria for accession to this union calls for the maintenance of an unchanged U.S. dollar value of a member countries' currencies for at least thirty-six consecutive months (for fixed exchange rate regime countries), as an indicator of currency stability. However, many of the floating exchange rate economies have experienced some difficulty in achieving this accession criterion, since it assumes that the REER for each prospective member is at, or relatively close to, its equilibrium value and therefore has no tendency to change. The results presented in this study can aid policymakers in the various territories in understanding the stochastic process of the REER, and the key factors, which lead to misalignment.

The remainder of this paper is arranged as follows. Section 2 presents a brief review of the previous Caribbean studies. Section 3 gives the methodological approach and data employed, while Section 4 presents the empirical results. Section 5 concludes with some summary remarks.

2. A Brief Review of the Caribbean Literature

Lewis (1972) provided one of the earliest discussions of the concept of a regional equilibrium exchange rate. The author noted that most regional currencies were misaligned, since the money costs of production, in terms of

---

1 The member countries of CARICOM are: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

wages, were too high relative to the average output per man-hour. Lewis argued that this unusual situation arose due to the transmission of high wages from the high productivity sectors (off-shore sectors) to the low productivity sectors through the efforts of trade unions. He therefore suggested that if regional currencies were to maintain any semblance of stability, an incomes policy would have to be implemented in each state. Such a strategy would ensure that regional exports remain competitive, and avoid balance of payments difficulties common in most developing economies.

Taylor (1974), building on Lewis' (1972) analysis, also addressed the issue of an optimum exchange rate policy for the region. The author noted that, *a priori*, the supply of foreign exchange, over the long run, is likely to be highly responsive to exchange rate variations given the nature of most regional exports (commodities and light manufactured goods). On the other hand, the low internal resource mobility present in most Caribbean nations, and the inflexibility in the aggregate demand structure, implies that the demand for foreign exchange is likely to be relatively inelastic. Combining these two conclusions, the author argued that shifts in the supply, rather than the demand, for foreign exchange are likely to be more destabilising within the region. However, he posited that to achieve exchange rate stability the opposite would have to be the case: the demand curve should have a greater influence on the exchange rate.

Modeste (1994) employed a more empirical approach to the study of real exchange rates. He attempted to identify the main determinants of the real exchange rate in Barbados using cointegration techniques and annual data covering the period 1974 to 1989. Modeste found that, based on bilateral real exchange rate indices between Barbados and several of its main trading partners, the United States of America (USA), the United Kingdom (UK) and Trinidad and Tobago (T&T), the nation's competitive position had declined over the period under investigation. Thus, he estimated a simple long-run regression to identify the main reasons for this deterioration, and observed that the nominal exchange rate, relative wages and relative productivity were all important determinants. Modeste did not provide estimates of exchange rate misalignment, but based on the econometric results, suggested that such problems could be corrected using an incomes policy, or a nominal exchange rate change.

Harriott and Worrell (1997) provided one of the first studies that attempted to derive equilibrium real exchange rate estimates for Caribbean and Latin American countries. They utilised a panel regression model of the real exchange rate, using the terms of trade, government consumption of non-tradables (a proxy for capital controls over capital inflows) and three macro-economic policy variables: the excess supply of domestic credit, the fiscal deficit as a ratio of lagged money and the rate of growth of credit. The coefficient estimates were obtained using the fixed effects estimator, and annual data over the period 1967 to 1995 for ten Caribbean countries. Harriott and Worrell's results indicated that Barbados' real exchange rate is not significantly different from its equilibrium value. However, no similar conclusions could be derived for T&T and Jamaica. One of the main shortcomings of the paper was that cointegration techniques were not employed to obtain the long-run equilibrium values. As a result, the equilibrium exchange rate estimates provided could have been subject to a large degree of error.

More recently, Francis (1998) examined the issue of whether the Jamaican dollar was overvalued in 1995. The paper utilised two approaches to address this question. The first method estimated a net exports function in order to assess whether a depreciation would improve the current account balance. The results supported the hypothesis that a devaluation could improve the country's external position. The second approach calculated an implicit exchange rate as the ratio of GDP (measured in nominal Jamaican dollars) to the purchasing power parity GNP in US dollars. This technique yielded the surprising conclusion that the exchange rate is in fact, undervalued. One of the main shortcomings of the second approach was that it calculated an equilibrium exchange rate which did not bear any direct relationship to whether the nation is in external or internal balance, but instead produced an estimate of the relative prices between two countries. On the other hand, the first approach does not allow one to conclusively assess whether the exchange rate is over- or under-valued as estimates of the optimal values of the explanatory variables in the export function would still have to be derived.

3. Methodology and Data

3.1 The Behavioural Equilibrium Exchange Rate Approach (BEER)

This paper uses the behavioural equilibrium exchange rate approach of Clark and MacDonald (1998) to provide an econometric analysis of the REER in the Caribbean. The approach begins by estimating a reduced form equation that explains the stochastic process of the REER over the period. The reduced form equation can be specified as:

$$q_t = \beta_1' Z_{1t} + \beta_2' Z_{2t} + \tau' T_t + \varepsilon_t \qquad (1)$$

where q is the REER, β_1', β_2' *and* τ' are vectors of reduced form coefficients, Z_1 is a vector of fundamental variables that influence the real exchange rate in the long run, Z_2 is a vector of fundamental variables that only impact on the real exchange rate in the medium term, T is a vector of variables which only have a transitory impact on the REER, and ε is a disturbance term with normal properties.

Within the BEER framework, the extent to which the REER is misaligned (m) can be expressed by:

$$m_t = \tau' T_t + \varepsilon_t + \left[\beta_1'(Z_{1t} - \bar{Z}_{1t}) + \beta_2'(Z_{2t} - \bar{Z}_{2t})\right] \qquad (2)$$

where a bar above the variable indicates its equilibrium value.[2] Equation (2) shows that exchange rate misalignment may be due to transitory factors, random

2 It is possible that outliers could affect the coefficient estimates. However, dummy variables included in the initial specification were insignificant and plots of the REER in Figure 1 showed no evidence of outliers.

disturbances, and how far the fundamental variables are away from their equilibrium values. The estimate of the equilibrium exchange rate misalignment is obtained as the residual between the fitted REER, from the long-run cointegrating model (referred to as BEER), and the actual REER.

The fundamental variables employed in this study are similar to those utilised by Clarke and MacDonald (1988) and include productivity relative to the country's main trading partners, openness, the fiscal balance and net foreign assets.[3] Assuming that prices for traded and non-traded goods are linked to wages, which are in turn linked to productivity, and wages are equalised across the two sectors, this would imply that the price of locally produced goods should increase at a slower rate for a nation with high productivity. As a result, the nation's REER should appreciate, even if purchasing power parity is assumed to hold. Thus, the REER is likely to be positively associated with the productivity differentials between the country under investigation and its trading partners.

A proxy to measure the level of trade restrictions in place in the nation, openness, is included in the econometric specification. Trade restrictions raise the prices of non-tradable goods as consumers attempt to substitute away from the now higher-priced imported good, therefore the relationship between the REER and the index of openness should be positive. However, in some small open economies (SOE) the significance of this substitution effect may be diminished if a large number of import substituting industries do not exist.

Government's fiscal position is also included in the econometric model, and is proxied by government consumption as a ratio to GDP. In the Mundell-Fleming model, an improvement in government's fiscal position increases national savings, and therefore lowers domestic interest rates and, by extension, the exchange rate. In contrast, the portfolio balance approach of Branson (1977) and Dornbusch and Fisher (1980), argues that a fiscal improvement should lead to an increase in the net foreign assets (NFA) of the nation, and should cause the real exchange rate of the nation to appreciate. As a result, the coefficient of the fiscal variable is ambiguous. The NFA of the banking system is included in the model as a separate explanatory variable, since greater NFA can result in a rise in domestic expenditure, which then leads to an excess demand for non-tradable goods, and by extension an increase in their price. Therefore, the REER and NFA should be negatively related.

3.2 *Econometric Approach*

This study uses the Johansen (1995) cointegration approach to derive the equilibrium exchange rate for Barbados, Jamaica and Trinidad and Tobago. The framework begins with a vector autoregressive (VAR) representation of the form:

$$y_t = \eta + \sum_{i=1}^{p} \Pi y_{t-i} + \varepsilon_t \qquad (3)$$

3 All the variables examined in previous studies were included in the initial specifications. The desired model was then chosen based on the cointegration test results. The relative real interest rate and the index of commodity export prices were two such variables which proved to be insignificant explanatory factors.

where y is an $n\times1$ vector of variables consisting of the REER, productivity differentials, openness, fiscal balance and NFA which may be I(1) or I(0), η is a $n\times1$ vector of deterministic variables, Π is an $n\times n$ coefficient matrix and ε is a $n\times1$ vector of disturbances with normal properties. If there exists a cointegrating relationship among the I(1) variables, Equation (1) may be re-parameterised into a vector error correction mechanism (VECM):

$$\Delta y_t = \eta + \sum_{i=1}^{p-1} \Phi_i \Delta y_{t-i} + \Pi y_{t-1} + \varepsilon_t \qquad (4)$$

where Δ is the first difference operator, and Φ is a $n\times n$ coefficient matrix. The rank of Π determines the number of cointegrating relationships. If the matrix Π is of full rank, n, then a VAR in levels is appropriate. If the matrix Π is of rank zero, then a VAR in first differences is suitable. However, if the rank of Π is less than n, then there exist $n\times r$ matrices α (adjustment matrix) and β (cointegrating vectors) such that $\Pi = \alpha\beta'$; Equation (4) provides the more appropriate framework. The β vector can be used to derive the long-run BEER and therefore allows one to examine how far away from equilibrium is the actual REER.

The Trace statistic (TR) is used to test for the existence of cointegration, amongst the non-stationary variables. The test statistic is derived from:

$$TR = T\sum_{i=r+1}^{N} \ln(1-\hat{\lambda}_i) \qquad (5)$$

and tests the hypothesis that there are, at most, r cointegrating vectors. The $\hat{\lambda}_{r+1},\ldots,\hat{\lambda}_n$ are the $N-r$ smallest squared canonical correlations between the y_{t-k} and Δy_t series.

3.3 Data Sources and Definitions

The study uses quarterly data over the period 1970Q1 to 2001Q4. The REER is a consumer price index (CPI)-based REER of a country's main trading partners relative to that of the domestic currency. The variable is defined as follows:

$$q = \sum_{i=1}^{N} w_i ln(e_i * p_i / p\ ) \qquad (6)$$

where w_i is the trade weight for partner country i, e is the bilateral nominal exchange rate, p_i is a measure of prices in trading partner country i, and p is the domestic price index. Equation (6) therefore implies that a rise in the REER

represents an improvement in external price competitiveness. The data on the consumer price indices and nominal exchange rates are obtained from the International Monetary Fund's (IMF) International Financial Statistics (IFS) database. The trade weights for Barbados are obtained from the Central Bank of Barbados' Annual Statistical Digest, for Jamaica the observations are derived from the Bank of Jamaica Statistical Digest, while those for Trinidad and Tobago are taken from the Central Bank of Trinidad and Tobago's Monthly Statistical Digest.

Productivity is proxied by real GDP per capita relative to trading partners. The GDP and population data for all three countries are recovered from the IFS database. Unfortunately, only annual real GDP data are available over the sample period. Therefore, the temporal disaggregation procedure proposed by Boot and Feibes (1967) is employed to obtain mathematically consistent, quarterly GDP values.[4] The productivity variable is a relative one; domestic GDP per capita is expressed as a ratio of the weighted average of the GDP values for the nation's main trading partners. Openness is calculated as the ratio of exports and imports to nominal GDP at market prices, and is obtained from the IFS database. The fiscal balance is proxied by the ratio of government consumption to nominal GDP at market prices, while NFA is the end of period net foreign assets of the banking system as a ratio of GDP. These variables are all obtained from the IFS database.

The calculated REER for Barbados, Jamaica and Trinidad and Tobago are plotted in Figure 1. The chart indicates that both Barbados and Jamaica have made sizeable competitive gains over the sample period. In Barbados, the REER in 2001 was estimated at 0.715, compared to only 0.224 at the beginning of the sample period. The improvement in Barbados' competitive position, during the latter half of the review period,[5] came mainly due to a slowdown in wage growth.[6] For example, between 1973 and 1987 the average annual rate of wage growth was estimated at 17.8%, or almost twice the rate of expansion obtained between 1988-2000. As a result of these excesses, the average rate of inflation during this period was uncharacteristically high for Barbados, estimated at 11.5% compared to only 3.2% between 1988-2001. Although significant gains have been made in the 1990s in terms of competitiveness in Barbados, since 1999 the rate of increase in the REER has been flat. This outturn seems again to have been due to large increases in wages between 2000 and 2001. It is estimated that in 2000 and 2001 nominal wages grew by 3.8% and 3.3%, respectively, while the average rate of inflation over this period was only 1.3%.

---

4 Note that disaggregation can introduce data distortions. However, Marcellino (1999) theoretically illustrates (and is recently backed up by Haug, 2002, using Monte Carlo techniques) that the local power of cointegration tests may be lowered when one reduces the number of observations in finite samples.

5 Barbados' main means of adjustment is through labour costs, given that its nominal exchange rate is fixed at BDS$2:US$1.

6 A reduction in real wages causes the price of non-traded goods to expand at a slower rate than those for traded goods and thus an improvement in the REER.

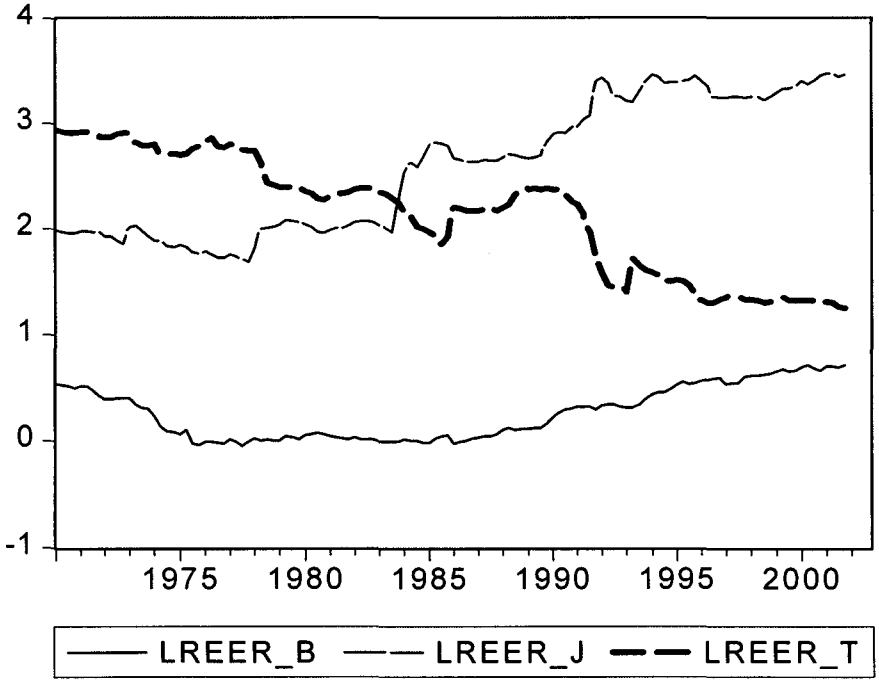
Jamaica has also recorded a significant expansion in external competitiveness during the period under investigation. In Jamaica, the REER began the review period at 2.898 and by the end of 2001 was estimated at 3.457. Unlike Barbados, most of this improvement in external competitiveness was obtained through steep nominal exchange rate devaluations and, to a lesser extent, a slowdown in real wage growth during the early 1990s. The Jamaican dollar began the review period at JAM$0.83/US$1 and by 2001 it had depreciated to JAM$47/US$1. The growth in the REER for Jamaica has not been consistent. For example, for most of the 1990s Jamaica's REER stagnated and even declined. Like Barbados, this scenario seems to have been due to unrealistic wage increases during the period. It is estimated that between 1993 and 1999, real wages rose on average by 10.8% per year. Since 1999 the REER has appreciated, indicating an improvement in external competitiveness. However, this adjustment again came through a nominal exchange rate depreciation rather than a slowdown in real wage growth. Jamaica's nominal exchange rate, which for most of the 1990s hovered around the JAM$35/US$1 mark, depreciated to JAM$46/US$1 by 2001.

Unlike the other countries, Trinidad and Tobago has recorded a consistent decline in its REER over the period.[7] Trinidad and Tobago, which began the period with a REER of 2.372 in 1970, ended the review period with a REER of only 1.256 (See Figure 1). This outcome was achieved in spite of a nominal exchange rate devaluation and real wage restraint. Trinidad and Tobago's nominal exchange rate which began the period at TT$2/US$1 ended the review period at TT$6.20/ US$1. One of the key reasons for this outturn is that Trinidad and Tobago's relatively high rate of inflation, which averaged 9.7% per year over the sample period, compared to only 5.3% in the USA, a country which accounts for 67% of total trade in Trinidad and Tobago.

---

7 This statistic may be surprising but accords with the values obtained from the IMF's International Financial Statistics database. It is also probably reflective of the significant competitive advantage Trinidad and Tobago had relative to other Caribbean countries at the beginning of the sample period, so while it records a decline in external competitiveness it still remains one of the largest suppliers of goods in the region.

Figure 1: REER in Barbados, Jamaica and Trinidad



Note: REER for each country is defined as $q = \sum_{i=1}^{N} w_i ln(e_i * p_i / p)$, where w_i is the trade weight for partner country *i*, *e* is the bilateral nominal exchange rate, p_i is a measure of prices in trading partner country *i*, and *p* is the domestic price index.

4. Estimation Results

The augmented Dickey-Fuller test statistics for the non-stationarity of the fundamental variables and the REER are given in Table 1. The approach tests the null of non-stationarity against the alternative of stationarity. The results show that all the variables are integrated of order one at classical levels of testing.

4.1 Barbados

In order to derive the BEER for Barbados, a cointegrating long-run relationship between the REER and the fundamental variables must be established. The specification used in this study constrains the constant to lie in the long-run relationship, and the lag length is set to two quarters based on the Schwarz criterion. The tests for cointegration among the variables presented earlier in Section 3 are provided in Table 2. This statistic indicates that there exists at most one cointegrating vector.

Table 1. Unit Root Tests

Country	lreer	lrgdppc	openness	fiscal	nfa
Levels					
Barbados	-2.480	-1.991	-2.277	-2.616	-2.180
Jamaica	-2.879	-2.618	-1.928	-2.652	-2.758
Trinidad and Tobago	-2.848	-1.846	0.607	-0.170	-2.723
First Difference					
Barbados	-2.932**	-5.116**	-4.347**	-6.866**	-6.118**
Jamaica	-7.328**	-3.282**	-5.835**	-2.989**	-5.401**
Trinidad and Tobago	-7.430**	-3.219**	-4.391**	-4.846**	-4.661**

Note: **, * indicate significance at the 1 and 5 percent significance levels, respectively.

The ADF statistics were chosen based on the Schwartz criterion.

Table 2. Tests for the Number of Cointegrating Vectors (Trace Statistics)

	Barbados	Jamaica	Trinidad and Tobago
$H_0 : r$	62.420**	106.780**	36.678**
1	30.815	60.517	12.029
2	11.837	38.335	2.274
3	4.476	19.560	0.719
4	n.a.	7.054	n.a.

Note: (a) ** indicates significance at the 1 percent significance level.
(b) n.a. indicates not applicable.
(c) Max-Eigen statistics were also calculated but are not reported since they yielded the same conclusions.

The cointegrating vector is therefore normalised on the REER, which produces the long run equation with standard errors given in Table 3. All the coefficients have their correct *a priori* signs, and are of plausible magnitudes. The alpha, or adjustment, matrix associated with this equation is given in Table 4. The alpha is negative and statistically significant in the case of Barbados, and suggests that the REER converges from disequilibrium to equilibrium by approximately 3% per quarter or 12% per year. Thus, the adjustment to a shock to the REER will be offset only after eight years. This relatively slow speed of adjustment in Barbados is primarily reflective of the fixed nominal exchange rate system, and the difficulty of adjusting real wages on account of the bargaining power of local trade unions.

Table 3. Long-Run Cointegrating Equations (Normalised on the REER)

	Barbados	Jamaica	Trinidad and Tobago
lrgdppc	2.737 (0.733)	0.270 (0.343)	1.281 (0.201)
open	1.962 (0.789)	1.188 (0.277)	-9.486 (2.345)
fiscal	-	-4.538 (0.937)	-
nfa	-0.396 (0.085)	-0.105 (0.023)	-0.269 (0.158)
trend	-	-0.014 (0.001)	-
c	21.278	0.721	-

Note: standard errors are given in parentheses.

Table 4. Speed of Adjustment from Disequilibria (Alpha Matrix)

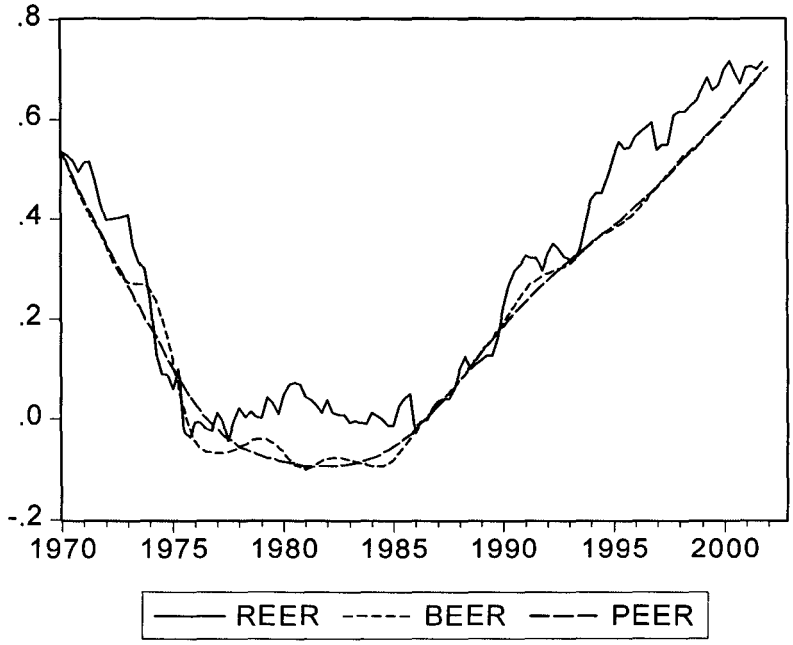
	Barbados	Jamaica	Trinidad and Tobago
Δ *lreer*	-0.030 (0.006)	-0.178 (0.042)	-0.009 (0.005)
Δ *lrgdppc*	0.003 (0.002)	-0.003 (0.008)	0.004 (0.001)
Δ *open*	-0.000 (0.003)	0.007 (0.011)	-0.002 (0.001)
Δ *fiscal*	-	0.004 (0.001)	-
Δ *nfa*	-0.037 (0.023)	-0.086 (0.124)	-0.032 (0.012)

Note: standard errors are given in parentheses.

The estimated BEER from the long-run cointegrating relationship, along with the actual REER in the period 1974 to 2001, is shown in Figure 2. One of the main features of the diagram is that the fundamentals, reflected by the BEER, can account for most of the fluctuations in the REER. The diagram shows that for the period 1978-1986 the real exchange rate was misaligned, with the actual REER significantly exceeding the BEER. The explanation for the level of under-

valuation achieved during this period was due in large part to a decline in NFA and an expansion in productivity relative to the country's main trading partners. A similar situation is also reported for the 1990-1993 period. However, the subsequent structural adjustment programme, which included an 8% pay-cut for public sector employees, served to restore equilibrium by causing an expansion in the NFA of the banking system and relative productivity. As a result, for much of the 1990s, Barbados' REER was undervalued, which was reflected by average current account surpluses of 2% of GDP. However, by the end of the sample period, the actual and equilibrium values converged as a result of a decline in relative productivity.

Figure 2: Estimated BEER and PEER for Barbados Compared with the Actual REER



The BEER approach calculates the equilibrium REER based on a behavioural equation. However, some of the explanatory variables may not have been at their equilibrium values. One can therefore use a smoothing technique, for example the Hodrick-Prescott filter,[8] to identify the degree of total exchange rate misalignment, and these estimates of the so-called permanent equilibrium exchange rate (PEER) are also provided in Figure 2. The chart shows a similar pattern to that obtained from the analysis of the BEER, with a period of

8 The Hodrick-Prescott filter is a mechanical smoothing procedure and therefore the values generated need not be reflective of internal or external equilibrium. However, they do effectively capture the underlying trend in the variables under consideration.

undervaluation in the eighties and late nineties, and a return to equilibrium by the end of the sample period.

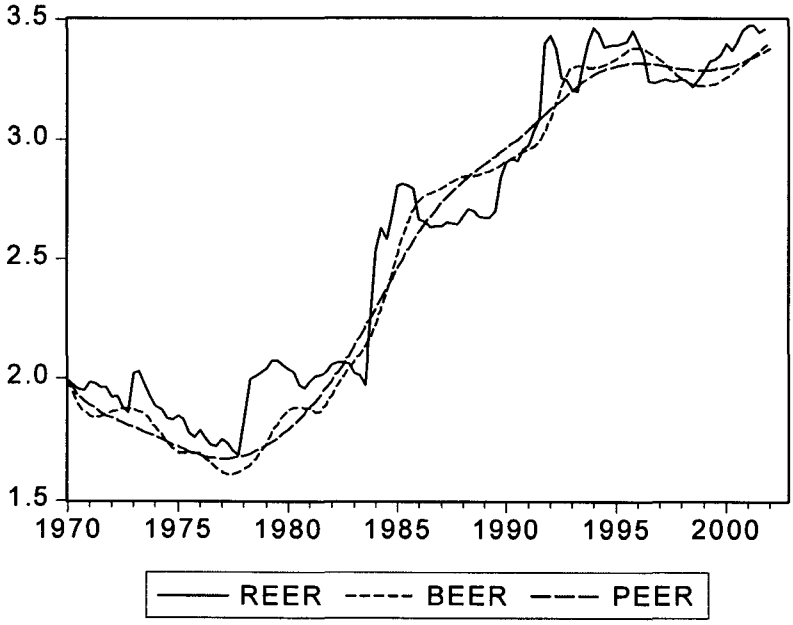
4.2 Jamaica

The VAR model used for the Jamaican exchange rate is quite similar to that for Barbados, namely, two lags and a restricted constant. However, a trend is also included in the cointegrating space. The model is chosen using the general-to-specific approach, based on the Schwartz criterion. The Trace statistic for Jamaica suggests that there exists at most one cointegrating vector.

The authors therefore normalise the cointegrating relationship on the REER, and the estimated model, along with the coefficient standard errors, is provided in Table 3. The signs of the variables agree with *a priori* reasoning and, except for the productivity variable, are of similar magnitudes to those obtained in the Barbados case. The adjustment matrix attached to this model is reproduced in Table 4. The negative and significant alpha suggests that the REER in Jamaica converges from disequilibrium to equilibrium by approximately 18% per quarter, or 72% per year. This speed of adjustment is much faster than in the case of Barbados and is reflective of the advantage of a floating over a fixed exchange rate, that is, the nominal rate is allowed to adjust to shocks to the system.

The estimated BEER from the long-run cointegrating model over the period 1970 to 2001 is provided in Figure 3. Similar to Barbados, the fundamentals explain most of the variation in the REER for Jamaica. The diagram also shows that for the period 1983 to 1984 the REER was significantly overvalued. However, this misalignment was corrected by a sharp contraction in the nominal exchange

Figure 3: Estimated BEER and PEER for Jamaica Compared with the Actual REER



rate from JAM$0.91/US$1 to JAM$1.78/US$1 by 1983. Another period of over-valuation was also observed during 1986 to 1992, which were all corrected by nominal exchange rate depreciations. As at 2001, the REER was therefore only 2% above its equilibrium level. Using the Hodrick-Prescot filter gives similar conclusions to those presented earlier.

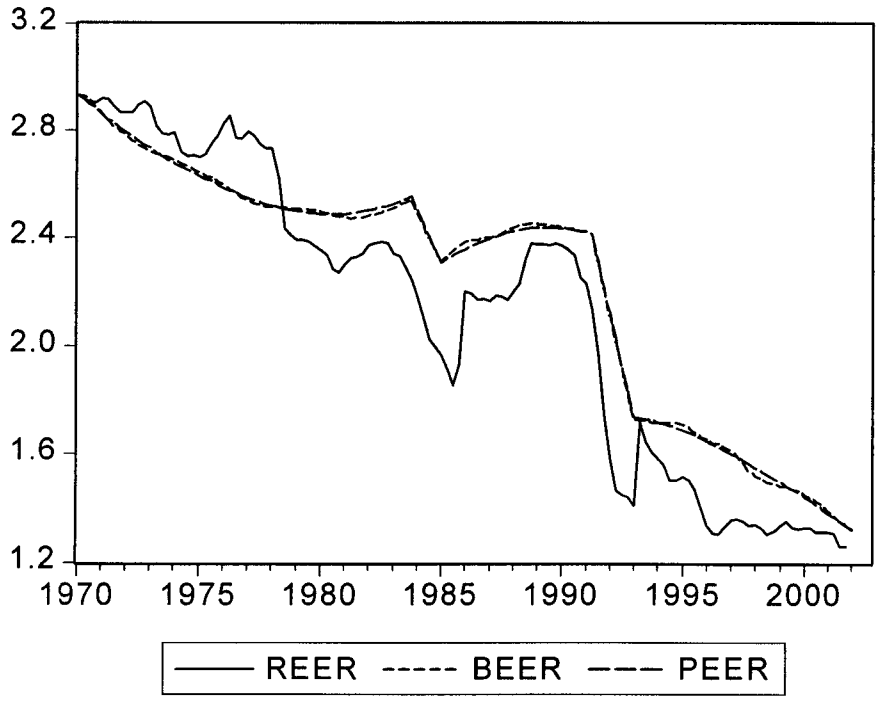
4.3 Trinidad and Tobago

The VAR model for Trinidad and Tobago is somewhat different from that estimated for Barbados and Jamaica. The specification does not include a trend or a constant; however, dummy variables accounting for recessionary periods in the early eighties and early nineties are included as unrestricted variables. Again, the lag length is set to two quarters and the Trace statistic indicates that, at most, there exists one cointegrating vector.

Normalising the cointegrating vector on the REER produces the long-run equation in Table 3. It shows that all the coefficients, except the openness variable, have their correct *a priori* signs and indicate that as the economy opens to more trade it may suffer a reduction in its external competitiveness. The adjustment coefficient is negative and significant at the 5% level. However, the magnitude of alpha suggests that the adjustment from disequilibrium to equilibrium is only corrected by 1% each quarter or by 4% in a year. As Worrell (2003) notes, although Trinidad and Tobago effectively maintains a floating rate regime, it also undertakes large exchange rate interventions to prevent significant fluctuations. As a result of this managed float policy stance, the adjustment from equilibrium to disequilibrium, as reflected by the small alpha coefficient, is quite sticky and more similar to that for Barbados rather than Jamaica.

Figure 4 plots the actual REER and the BEER and PEER for the period 1970 to 2001. The figure shows that contrary to the previous two countries, Trinidad and Tobago's REER is more likely to be over-valued rather than under-valued. Two periods justify a closer analysis. First, over the period 1971 to 1976 the REER was significantly misaligned. This disequilibrium was corrected by pegging the nominal currency at a level below its value in the previous quarter, an effective nominal exchange rate depreciation. Again in the 1992 to 1993 period the REER was significantly misaligned and, as a result, national policy makers took the decision to float the currency, which immediately resulted in a depreciation of the currency from TT$4.25/US$1 to TT$5.76/$US1 and brought the actual REER closer to its equilibrium value. However, due to significant exchange rate intervention in the latter half of the 1990s, the REER was somewhat misaligned, but by 2001 it had converged to its equilibrium value, and was therefore only 6% below its equilibrium value.

Figure 4: Estimated BEER and PEER for Trinidad and Tobago Compared with the Actual REER



5. Conclusions

Although the idea of an equilibrium exchange rate for the region has been discussed in numerous studies since 1972, little empirical research exists which employs rigorous econometric techniques to identify the equilibrium REER for the Caribbean. This study uses the BEER approach to derive the equilibrium exchange rate for Barbados, Jamaica, and Trinidad and Tobago over the period 1970 to 2001. The BEER approach calculates the degree of REER misalignment as the difference between the actual REER and that based on the current values of the fundamental variables. The results from undertaking this analysis suggest that at the end of 2001, the REER for Barbados and Jamaica were slightly above their equilibrium values, while that for Trinidad and Tobago was below its equilibrium value.

In Barbados, given the fixity of the nominal exchange rate, real exchange rate misalignment is most effectively controlled using real wage changes. This leads to the conclusion that general wage agreements should not only take into account productivity changes, but also the degree of exchange rate misalignment when negotiating salary increases. This policy prescription is, however, limited by the bargaining power which most local unions have over the market. In contrast, REER misalignment in Jamaica is effectively corrected using nominal exchange rate depreciations or appreciations. Unlike the previous two territories, Trinidad and Tobago's REER seems to be more prone to overvaluation rather than undervaluation. This unusual situation seems to reflect the intervention

undertaken on the part of the monetary authorities in order to maintain a stable exchange rate. Another interesting point that is brought out in the study is that the countries are generally improving in terms of competitiveness but at significantly different speeds. For example, Barbados and Jamaica both recorded expansions in the REER, indicating an improvement in competitiveness, while Trinidad and Tobago registered a decline.

One policy recommendation emanating from these findings is that the REER in each territory should be kept as close as possible to its equilibrium level. In Barbados, this would be achieved through wage adjustments and productivity changes. This policy prescription would avoid the problem of some territories fixing their exchange rates at arbitrary values which are not consistent with either internal or external equilibrium, and therefore could result in balance of payments difficulties (see Barbados circa 1991) and/or significant nominal exchange rate depreciations. In order to make this policy recommendation consistent with convergence criteria, one possibility is to keep the exchange rate stability criterion as it is but define stability to be within a band measured around the country's BEER such that each year the BEERs should converge by a predetermined rate.

References

Boot, C.G., W. Feibes and J.H.C. Lisman. 1967. "Further Comments on the Derivations of Quarterly Figures From Annual Data." *Applied Statistician* 16 (1): 65-75.

Branson, W. 1977. "Asset Markets and Relative Prices in Exchange Rate Determination." Institute for International Economic Studies, Reprint.

CARIFTA Secretariat. 1972. *The Economics of Devaluation Under West Indian Conditions*. Georgetown.

Clark, P.B. and R. MacDonald. 1998. "Exchange Rates and Economic Fundamentals: A Methodological Comparison of BEERs and FEERs." IMF Working Paper WP/98/67. International Monetary Fund, Washington.

Clark, P.B. and R. MacDonald. 2000. "Filtering the BEER: A Permanent and Transitory Decomposition." IMF Working Paper WP/00/144. International Monetary Fund, Washington.

Dornbusch, R. and S. Fischer. 1980. "Exchange Rates and the Current Account." *American Economic Review* 70 (5): 960-971.

Edwards, S. 1987. "Exchange Rate Misalignment in Developing Countries." Discussion Paper No. 442, World Bank, Washington.

Elbadawi, I. 1994. "Estimating Long-run Equilibrium Real Exchange Rates." In J. Williamson (ed), *Estimating Equilibrium Exchange Rates*, Institute for International Economics. Washington.

Farrell, T. and D. Worrell. 1994. *Caribbean Monetary Integration.* Caribbean Information Systems and Services, Port-of-Spain, Trinidad and Tobago.

Francis, A.A. 1998. "Is the Jamaican Dollar Overvalued?" *Social and Economic Studies* 47 (4): 29-45.

Harriott, K.K. and D. Worrell. 1997. "Estimating Equilibrium Real Exchange Rates: A Menu Approach." Central Bank of Barbados Working Papers. Bridgetown.

Haug, A.A. 2002. "Temporal Aggregation and the Power of Cointegration Tests: A Monte Carlo Study." *Oxford Bulletin of Economics and Statistics* 64 (4): 399-412.

Johansen, S. 1995. *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models.* Oxford University Press, Oxford.

Lewis, A. 1972. "Statement at the Second Annual Meeting of the Board of Governors of the Caribbean Development Bank."

MacDonald, R. 1997. "What Determines Real Exchange Rates? The Long and Short of It." IMF Working Paper WP/97/21. International Monetary Fund, Washington.

Marcellino, M. 1999. "Some Consequences of Temporal Aggregation in Empirical Analysis." *Journal of Business and Economic Statistics* 17 (1): 129-136.

Modeste, N. 1994. "The Determinants of the Real Exchange Rate: The Experience of Barbados." *Social and Economic Studies* 43 (4): 183-196.

Taylor, L. 1974. "Some Thoughts on an Optimum Exchange Rate Policy for the Caribbean." *Social and Economic Studies* 23 (3): 454-464.

Williamson, J. 1994. *Estimating Equilibrium Exchange Rates.* Institute for International Economics, Washington.

Worrell, D. 2003. "A Currency Union for the Caribbean." IMF Working Paper WP/03/35. International Monetary Fund, Washington.

Section E:
Financial Markets

19

A Survey of Capital Market Development in The Bahamas

Elvan Kayral-Morris

Abstract

This study attempts to explore and analyze the structure of the capital markets in The Bahamas and the linkages between capital markets and economic growth over the period 1992 to 2002. The capital markets exhibit direct and indirect participation by private individuals, the Government, government corporations, and institutional investors such as pension funds. The Bahamas International Securities Exchange (BISX), formed as a private company, is in its infant stage. This paper analyses data on domestic credit to the private sector through commercial banks, other local financial institutions, and the Bahamas Development Bank, stock market capitalisation, and public debt market capitalisation. The key areas of focus identified for accelerated growth for Bahamian capital markets are international recognition, modernisation of government services, foreign ownership, credit reporting system, human resources, regional integration, and public education.

Introduction

Capital markets play an indispensable role in the development of the Bahamian economy in terms of financing. The main pillar of the economy, tourism, as well as industries such as agriculture and fisheries, manufacturing, distribution, entertainment and catering, transport and construction, benefits from the different capital-raising options available. Although the bulk of the foreign direct investment is channelled to tourism and related sectors, the accessibility to different sources of funds by other industries is observed to have aided the diversification of the economy. Commercial banks, the Government, public corporations, Bahamas Development Bank and the newly established Bahamas International Securities Exchange are some of the parties involved in the capital markets.

Previous literature on capital market developments in the context of financial development and economic growth points out the close (positive) relationship between the two, based on the idea that financial development improves the efficiency of capital allocation. The most influential work in this area is by McKinnon, (1973), who studied the relationship between the financial system and economic development in Argentina, Brazil, Chile, Germany, Indonesia, Korea, and Taiwan in the post-1945 period. He concludes that better functioning financial systems support faster growth. King and Levine (1993), using cross sectional data from 80 countries during the period 1960-89 and four measures of the level of development - size of financial intermediaries, the degree to which banks versus the central bank allocate credit, the ratio of private credit to total domestic credit and private credit as a ratio of GDP - also show a strong positive link between financial development and growth and that financial development has predictive power for future growth. Among other studies taking a more micro-economic approach, Demirgüç-Kunt and Maksimovic (1996), by analyzing industry-level growth performance, argue that firms with access to more developed stock markets grow faster. Khan and Senhadji, (2000) using the financial development dataset developed by Beck, Demirgüç-Kunt, and Levine (1999) and the International Financial Statistics of the International Monetary Fund, confirm the strong positive and statistically significant relationship between financial depth and growth in their cross section analysis. However, they conclude that there remains further need to analyze a potential non-linearity between financial depth and growth, the effects of legal and regulatory reforms that support the development of securities markets, and the interlinkages between domestic and international financial markets.

In this paper, the Bahamian capital markets are examined on a component-by-component basis, using the factors identified in Khan and Senhadji (2000). By looking at the trends and structure of these capital markets development indicators, some of the areas that work well and those that need to be improved or changed in the current system are identified.

Section 2 presents a general overview of the Bahamian economy with discussions of major macroeconomic indicators. Section 3 gives a brief history of capital markets in The Bahamas and introduces the main players and products available in the market. Section 4 examines the role of the Bahamas International Securities Exchange in comparison with other major securities exchanges in the Caribbean region. Section 5 provides a discussion of the major financial depth indicators for the Bahamian economy. Section 6 gives an overview of the main barriers to capital markets development from regulatory and investor perspectives and discusses prospects for a better functioning capital market in The Bahamas. Section 8 concludes the paper.

An Overview of the Bahamian Economy

It is estimated that the real Gross Domestic Product (GDP) of The Bahamas grew from 1997 to 2002 at an average annual rate of 2.63 percent (see Graph 1). The Bahamian economy enjoys the benefits of its natural endowments of year-round warm weather, powdery sand beaches and turquoise waters that attract close to four million tourists a year. With tourism as its number one contributor

(approximately 40%) to the total GDP, The Bahamas has attained a GDP per capita of over $16,000 which is among the highest in the Caribbean region. The tourism sector of The Bahamas is exposed to general global economic conditions, mainly trends in the economy of the United States, from where roughly 80 percent of the visitors originate

The number two contributor to the total GDP, the financial services, with approximately 15 percent, branches out into two sections: domestic and offshore. The domestic side of the financial services includes the banking sector, with over US$5.3 billion in total domestic assets attributed to nine clearing banks and sixteen authorized agent trust companies, and the insurance sector where subsidiaries or branches of Canadian and American, as well as Bahamian owned, life insurance companies are represented with approximately US$650 million in total domestic assets. On the offshore side of the financial services sector, the estimated asset base is in excess of US$289 billion and there is a total of 292 offshore banks and trust companies of which 46 are euro currency branches of foreign banks and trusts, 130 are Bahamian incorporated, 105 hold restricted and 11 hold non-active licenses.

The remaining 45 percent of the total GDP comes from Government (20%), construction (8%), other (8%), agriculture and fisheries (5%) and manufacturing (4%).

On the employment side, The Bahamas enjoys a relatively low unemployment rate of 9.1 percent compared to some of its English speaking Caribbean neighbors with figures of 15.5 percent in Jamaica, 10.3 percent in Barbados and 10.5 percent in Trinidad and Tobago. According to the Department of Statistics, Statistical Abstract (1999), 34 percent of the workforce is employed in the community, social and personal services industry, followed by 16 percent in hotels and restaurants, 13 percent in wholesale and retail and 9 percent each in construction, transport, storage and communication, finance, insurance, real estate and other business services industries. The agricultural, hunting, forestry and fishing, and manufacturing industries each employ 4 percent of the labour force. The remaining 1 percent of the workforce is employed in mining and quarrying, electricity, gas and water industries.

Due chiefly to its high concentration in the services and low concentration in the manufacturing sectors, coupled with unsuitable land for many agricultural activities, the Bahamas imports 50 percent of its GDP mainly from its closest North American neighbours.

The national currency, the Bahamian dollar, is pegged one to one to the United States dollar. All foreign exchange transactions are monitored and controlled by The Central Bank of The Bahamas.

Due to the openness of the economy and the country's close economic linkages with the United States, inflation has been historically relatively stable and parallel to rates prevailing in the United States. In spite of higher energy costs in the last decade, the inflation rate has come sharply down from 5.6 percent in 1992 to 2.2 percent in 2002.

Capital Markets in The Bahamas

The Role of Capital Markets

No different from a market for any other good or service, capital markets in The Bahamas provide a platform to match those looking to raise funds with those seeking to invest. From informal lending schemes to today's sophisticated financial products, capital markets have evolved to fit the needs of both the issuer and the investor. Outdated roles have been abandoned and new intermediaries have emerged over the years to add to the mix of players in the market. The tools used by all parties involved have also received their own share of the evolution mainly brought about by the latest technology. Government, on the other hand, has found itself in a race to modify existing laws and create new ones to keep abreast of the rapid dynamics of the market for the protection of all parties.

Players and Products

There is a wide range of different types of capital markets in the world. Dictated by many factors such as the size of their economy, laws, population, savings habits, natural resources and even wars and natural disasters among many others, capital markets in each country differ in size, efficiency and structure. The key players and products available in the capital markets of The Bahamas are discussed below.

Private Individuals and Savings

Investment options available in The Bahamas to its residents vary domestically and are limited by foreign exchange regulations internationally. Real estate, bank deposits, insurance schemes, equity and fixed income securities and pension plans are among the main investment options available domestically.

The first commercial bank in The Bahamas opened its doors in 1837 and in 2003, the number of commercial banks have risen to nine, consisting of many major world brand names which provide domestic and international banking services to Bahamians and visitors alike.

Graph 2 shows the trend in total deposits by private individuals broken down by type of deposit: fixed, savings, and demand deposits. In general, total deposits by private individuals have been on an up-trend since January 1992, largely due to growth in fixed and savings deposits, which, except for the period March to June 1999 when there was a sharp increase of 8.6 percent, grew by an average rate of 0.6% per annum.

Government and Public Debt

The Government of The Bahamas has been a major player in the development of the capital markets in The Bahamas. According to the fiscal year 2003/2004 budget, total government debt is projected to reach US$1.8 billion (34.4% of GDP), consisting of US$1,390.2 million in bonds and US$179.4 million in Treasury bills.

The major government securities markets are in the United States, Japan, and Europe. In the United States, the largest of all, the supply of public debt instruments has reached over US$6,006.0 billion, although the supply of U.S. treasuries is shrinking and is projected to fall to very low levels by 2010. In Japan, which has the second largest securities market in the world, the national government debt was US$5,088.7 billion by the second half of 2002. In Europe, with the introduction of the Euro, there are now twelve separate sovereign issuers of euro-denominated government securities with a combined debt of US$4,354.8 billion as at year-end 2001. On the smaller end of the scale, in the Caribbean region, the Organization of Eastern Caribbean States, comprised of eight small island nations, the total public debt was US$1 billion as at year-end 2002. In Jamaica, year-end 2002, the public debt has passed US$6.9 billion while in Barbados, the figure approaches US$1.3 billion.

In general, there are three main characteristics of government securities and the markets they trade in that distinguish them from private securities: minimal credit risk, high liquidity and a wide range of maturities, and well-developed market infrastructure. While all three of these characteristics exist in major developed countries, many of the developing nations, including the Caribbean islands, are at the lower end of the spectrum of advanced government securities markets.

The characteristic that is common to most government debt is minimal credit risk. Although perceptions of credit risk on government debt differ across countries and in how they compare to corporate debt, backed by tax revenue, government debt is usually perceived as less risky than corporate debt. The Bahamas' total internal debt was US$1.7 billion as of year-end 2002 while its total external debt was US$96.0 million, inclusive of a US$50.0 million bond offering in 1997. The most recent foreign currency bond is the US$200.0 million was issued in the summer of 2003.

The Government of the Bahamas issues both short and long term debt instruments ranging three months to twenty years in maturity. The liquidity of The Bahamas Government Registered Stock (BGRS) is facilitated by the Central Bank of The Bahamas which acts as the sole agent to provide clearance and settlement as well as manage a trading platform for the low volume secondary market for government securities.

Government Corporations and Privatization

In The Bahamas the state owned and operated companies in and out of the utilities sector. There are eight main government corporations in The Bahamas: Bahamas Electricity Corporation (BEC), Bahamas Telecommunications Corporation (BTC), Water and Sewerage Corporation, Bridge Authority, Bahamas Development Bank (BDB), Bahamasair, Bahamas Mortgage Corporation (BMC) and the Bahamas Broadcasting Corporation. Other public corporations include the national flag carrier, the only television station and an authority that manages the two bridges that connect the New Providence and the Paradise Island.

The role of public corporations in the capital markets of The Bahamas is manifested in two main areas. First is the classical question of funding. Five of these eight public corporations - the BEC, BTC, Water and Sewerage Corporation, the Bridge Authority, and the Bahamas Broadcasting Corporation are basically monopolies. Yet only the BEC and the Bridge Authority have been profitable over the years. Unable to sustain their operational costs, the government corporations' traditional main source of financing has been internal and external government guaranteed and other loans. Currently, the BMC and the Bridge Authority issue government guaranteed publicly traded bonds. In the case of the BMC, which specializes in mortgage lending activities such as loans to individuals to build on their own lots and to purchase new and existing homes, and turnkey projects, the Bahamas Mortgage Corporation Act authorises the BMC to issue bonds in denominations of US$100,000 and up to an amount of US$120 million which are guaranteed by the Government and serve as a source of funding for the corporation. With US$97.2 million outstanding, the BMC bondholders are mainly comprised of the National Insurance Board, commercial banks and insurance companies. The Bridge Authority, which was established by an Act of Parliament in June 1998 as a continuation of the former Paradise Island Bridge Authority to acquire the existing bridge extending between Paradise Island and Potters Cay, to manage, maintain, and operate the Bridge and its facilities, and to regulate vehicular traffic, has a relatively smaller outstanding debt of US$28.0 million which was fully subscribed in a March 1999 public bond offering. Overall, by the end of the second quarter of 2003, total government guaranteed debt of public corporations has eased steadily to US$359.7 million.

Outside the perimeter of the traditional notion of channelling savings to public companies in the context of equity markets and to debt financing in the context of bonds markets, another role that the capital markets play is restructuring. This issue is clearer in the case of privatisation in The Bahamas where the Government has started to explore options for selling at least a part of its share in some of the state-owned corporations. With shifting political regimes and perspectives of fiscal policy, the role of these companies as monopolies or even government corporations is no longer a given. The recent consideration of privatisation of the BTC (49% of equity), accompanied by potential regulatory changes in the telecommunications industry regarding licensing, has opened doors to competition.

Institutional Investment

Institutional investment covers mainly the activities of private pension funds, cash and investments of the National Insurance Fund, current assets and investments of insurance companies, and deposits and shares placed at credit unions in The Bahamas. There are 131 registered pension plans, the majority of which have been established during the 1980s although 10 funds, including the three largest sponsored by public corporations, have been in existence since at least 1970. Labour force participation in private pension funds corresponds very closely to cyclical employment trends, especially in the hotel sector. In that regard the percentage of the employed work force covered by pension schemes during the period varied between 18.3 percent (1997) and 23.3 percent (1995).

According to a 2001 survey[1] of private pension plans undertaken by The Central Bank of The Bahamas, the domestic assets in pension schemes are likely to surpass the US$1 billion mark by 2005, from just over US$300 million in 1992. The average increase in the share of institutional investment over the Gross Domestic Product between 1998 and 2001 was 4.1% per year. Table 1 shows that at end-2001, accumulated pension fund assets were equivalent to approximately 16.1 percent of GDP (US$793.5 million), the National Insurance Board, 20.2 percent of GDP ($991.5 million), insurance companies, 10.3 percent (US$48.7 million) and credit unions, 2.1 percent (US$120.4 million). Also in recent years, schemes have invested more heavily in equities and loans, which currently account for portfolio shares of 14.4 percent and 10.0 percent respectively, compared to 8.0 percent and 1.8 percent in 1995. Mutual funds also firmed to 4.6 percent of total investments from approximately 1.0 percent in 1995. Although still the dominant holdings, investments in the Bahamas Government Registered Stock (BGRS) and deposits decreased steadily from the mid-1990s to 25.7 percent and 23.1 percent, respectively. Real estate, investments in employer businesses and private companies' bonds made up the remaining pension fund assets with 11.4%, which has fallen slightly compared to the mid-1990s. Finally, on a sectoral basis, investments in the communication and utilities (35.0%), financial services (24.6%) and hotels and restaurants (20.7%) sectors dominate the portfolio asset structure of pension funds.

Small Business

Small business has been an entrepreneur driven and often disadvantaged child of the Bahamian economy. It contributes to the diversification of the Bahamian economy by adding to the large-scale tourism and offshore financial activities. Fishing, transportation services, and agriculture are good examples of small and medium-scale enterprise sectors in The Bahamas.

Although The Bahamas has a well developed tourism and financial services sector, financing opportunities available to small and medium scale enterprises have been historically limited. The recorded financing to small business is mostly channelled through the Bahamas Development Bank (BDB), which in turn obtains financing support from the government and multilateral agencies like the Inter-American Development Bank and the Caribbean Development Bank. According to the recent data in the BDB 2000 Annual Report, US$9.9 million worth of new loans had been made during the year 2000, creating almost 500 new jobs. The 2000 total portfolio of the BDB was US$39.8 million, of which US$25.1 million is current, US$4.0 million is 31-90 days and US$10.7 million is non-performing. During the year 2000, 32.0 percent of the total approvals were for projects in New Providence, with the remaining 68.0 percent in the Family Islands. Of US$3.2 million approvals in New Providence, the service sector received the biggest share, 66.7 percent, followed by transportation, fishing, manufacturing, agriculture and tourism, with 14.9 percent, 11.4 percent, 4.0 percent, 2.4 percent and 0.6 percent,

---

1 Central Bank of The Bahamas, *Quarterly Economic Review,* June 2003.

respectively. In the Family Islands, there was a more even distribution of approved funds; however, the service sector still got the biggest share with 28.6 percent, closely followed by the tourism sector with 27.8 percent. Approvals to the transportation and fishing sector were 21.1 and 20.7 percent, respectively, while manufacturing and agriculture received only 1.0 and 0.8 percent, respectively.

In an attempt to introduce competition from commercial banks for small business financing, the Inter-American Development Bank (IDB) approved a $21 million project in 1993. The funds for this project were made available to the BDB which, in turn, would auction them off to private commercial banks for small business financing. With this project, the IDB hoped to strengthen the domestic capital markets by creating a structure where alternative sources to credit for the small business would be stimulated. The effort proved to be rather ineffective as no bids were received for the funds from commercial banks, and by late 2001, the loan expired.

This behaviour of the commercial banks should not be seen as uncommon as a close look at the corporate structure of many of the small businesses reveals that they are sole proprietorships. According to an observation made by a Chamber of Commerce-commissioned study in 2002, lenders, including commercial banks, rather than focusing on the business risks associated with the loans when making a decision, center on the credibility, credit worthiness and assets of the individuals behind the loan and treat it as a personal loan. Therefore, many small business loans get classified as personal loans that use personal properties as collateral. This portion of the financing obtained by small business goes incorrectly classified, rather than unrecorded.

Bahamas International Securities Exchange and Other Selected Securities Exchanges in the Caribbean

With its mission statement, "... to create a state-of-the-art securities exchange for the delivery of innovative and efficient financial services",[2] the Bahamas International Securities Exchange (BISX) opened its doors in May 2000 in Windermere House in Nassau. With 44 shareholders and a seed capital of US$5.5 million, it is registered as a private[3] company under the Securities Industry Act of 1999.

Table 2 presents some indicators of the BISX and five other securities exchanges in the Caribbean region, namely the Cayman Islands Securities Exchange, Bermuda Stock Exchange, Jamaican Stock Exchange, Eastern Caribbean Stock Exchange and the Trinidad and Tobago Stock Exchange. The BISX is a fledgling securities exchange in the region, with a market capitalisation of approximately B$1.7 billion (34.0% of GDP). The "oldest" regional stock exchange,

---

2 Bahamas International Securities Exchange Limited, Private Placement Offering Memorandum, September 1999, p. 12.

3 Companies with more than 50 shareholders are deemed to be "public companies" under the Securities Industry Act (SIA) of 1999. The SIA requires more stringent public reporting and disclosure for such companies than that currently required of private companies.

the Jamaican Stock Exchange, which was established in 1968 as a private limited company, currently has a total market capital of Bahamian $5.9 billion. The Bermuda Stock Exchange was established in 1971 as a non-profit institution primarily for the domestic equities market. In 1992, with the growth of the offshore sector in Bermuda, it was restructured into a for-profit company and today it is the world's largest offshore, fully electronic securities market, offering a full range of listing and trading opportunities for international and domestic issuers of equity, debt, depository receipts, insurance securitisation and derivative warrants with a market capitalisation of around Bahamian $125 billion. More than 62 percent of securities listed on the Bermuda Stock Exchange are offshore funds. After the Bermuda Stock Exchange, the Cayman Islands Stock Exchange has the second largest market capitalisation of Bahamian $38.2 million. The Cayman Islands Stock Exchange was established in 1997 as a private limited company owned by the Cayman Islands government, but operates as an independent entity. It was originally set up to provide a listing facility for the specialist products of the Cayman Islands, namely, offshore mutual funds and specialist debt securities. More recently, the facility has been expanded to include global depositary receipts and derivative warrants. The Trinidad and Tobago Stock Exchange was established in 1981 under the auspices of the Ministry of Finance as a response to government's policy to localise the foreign-owned commercial banking and manufacturing sectors of the economy and to get such companies to divest and sell a majority of their shares to nationals. The Eastern Caribbean Stock Exchange was created by the Eastern Caribbean Central Bank in 2001 and is the first regional securities exchange in the Western Hemisphere encompassing the eight member territories of Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines.

There are sixteen listed companies on the BISX, all of which are domestically owned and the majority derive from the non-banking finance sector (29.4 percent), followed by the banking, communications and media, and trading sectors with 23.5 percent, 11.8 percent, and 5.9 percent respectively. The "other" category, consisting of firms in the healthcare industry, a property fund, entertainment and multimedia, comprises 29.4 percent of the total number of firms listed. There are currently no tourism, manufacturing or conglomerate firms listed on the BISX. A closer look at the sectoral and market breakdown in the neighboring Caribbean stock exchanges reveals wide differences. The Cayman Stock Exchange is at one extreme with over 600 offshore sector securities listed, while the Eastern Caribbean Stock Exchange has only two banks listed which are both domestic companies. The Bermuda Stock Exchange is the only stock exchange under review that has both domestic and offshore securities listed. The Jamaican Stock Exchange, on the other hand, has a relatively more diverse composition of domestic firms. The Trinidad and Tobago Stock Exchange, also with only domestic firms, draws attention with its large number of manufacturing firms listed (30.6%).

Financial Development Indicators

Based on the work of Khan and Senhadji (2000), this study identifies proxies for financial development and analyses data on domestic credit to the private

sector through commercial banks, other local financial institutions, and the Bahamas Development Bank (BDB), as well as looks at stock market capitalization and public debt market capitalisation.

Domestic credit to the private sector serves as a measure of financial intermediation. By separating the credit to the public sector from the credit to the private sector, a better indication of the role of the financial intermediaries and the effects of credit to the private sector can be obtained. The total domestic credit to the private sector is further broken down by type of lending institution and by sector. Domestic credit to the private sector mainly reflects the influence of the banking sector as an indicator of financial development on economic growth. In order to capture the effects of equity and bond market development, the stock and bond market capitalisation as an indicator of capital markets development is incorporated.

Graph 3 shows the trends of the above-mentioned variables as a percentage of Gross Domestic Product (GDP). While the shares of domestic credit to the private sector, public bond market and Treasury bill capitalisation stayed within a relatively narrow band of 100 basis points each, the share of stock market capitalization depicted an upward trend. Below, these datasets are examined closer.

Domestic Credit to Private Sector

The dataset regarding the total domestic credit to the private sector covers a period of ten years beginning in January 1992 and closing at year-end 2002. Total domestic credit to the private sector, including personal loans, started out at US$1.5 billion (52.4% of GDP) in January 1992 and reached $3.7 billion (71.1% of GDP) by year-end 2002, peaking at 72.0% of GDP in November and December of 2001. Personal loans constituted the majority of total domestic credit to the private sector, gradually increasing from 60 percent in January 1992 to almost 70 percent by year-end 2002. In this regard, a separate variable, which omits the amount of personal loans and only takes into account sector loans (excluding government and public sectors) has been created in an effort to isolate the effects of private sector loans dedicated to personal and public consumption. As previously discussed under Small Business above, there is one problem associated with excluding all personal loans from total domestic loans for the private sector: although, in theory, personal loans given by commercial banks and other local financial institutions are utilised for land and building purchases and consumer credit in general, in practice, sole propriety small business loans may fall under personal loans due to their owner using his/her personal credit and assets as collateral to secure a loan for his/her small business. Due to limited categorization[4] of personal loans which provides little or no indication about where

4 In addition to land/building purchase loans, consumer credit is broken down to these eleven categories: private cars, taxis and rented cars, commercial vehicles, furnishings and domestic appliances, travel, education, medical, home improvement, consolidation of debt, miscellaneous and credit cards.

small business loans might be included, this item is omitted from the dataset. This credit variable reveals a relatively stable pattern as a share of GDP to that of total domestic credit to the private sector, including personal loans. While it starts out at US$543.1 million in January 1992 (19.0% of GDP), it has doubled to US$1,064.9 million (20.8% of GDP) by year-end 2002.

In this study, there are three types of institutions that provide funding to the private sector. They are commercial banks, other local financial institutions and The Bahamas Development Bank. Graph 4 shows the breakdown of total domestic credit to the private sector, excluding personal loans, by institution. Commercial banks provide an overwhelming share (78% to 85% for the last ten years under review).

The second type of classification made, by type of industry, regardless of source of financial support, categorizes the industries under twelve groups. They are agriculture, fisheries, mining and quarrying; manufacturing; distribution; tourism, entertainment and catering; transport; construction; financial institutions, other professional financial services; and miscellaneous. Table 3 shows the breakdown of total domestic credit to the private sector, excluding personal loans, by sector. In the agriculture, fisheries, mining and quarrying sector, the amount of credit given has gradually increased at an average annual rate of 12.5 percent between 1992 and 1998 and has fallen steadily since 1998 at an average annual rate of 6.5 percent. Graphs 5a and 5b depict the share of each sector over the total domestic credit to the private sector and reveals a similar pattern to the growth in credit to the agriculture, fisheries, mining and quarrying sectors. In the manufacturing sector, a relatively stable rate of increase in the credit amount of 2.8 percent per year and a stable share of total credit of around 5 percent until 1999 are observed. After 1999, manufacturing has steadily lost its share of the total credit and at year-end 2001, it has 3.7 percent of the total private sector credit. The distribution sector has experienced an average annual growth rate of 5.9 percent while maintaining an over 2 percent share of the total domestic credit to private sector every year in the last ten years. The biggest contributor to the GDP, tourism, entertainment and catering received only 9.4 percent (1995) to 6.7 percent (1998) of the total domestic credit to private sector with an average annual growth rate of 6.2 percent in the period under review. The transport sector has maintained its share of 2.0 to 3.2 percent over the total domestic credit to the private sector every year over the last ten years. It has experienced an average annual growth rate of 5.4 percent in the total funds allocated with the biggest increase in 1994 (16.5%). Between 1996 and 1999, there has been a decline in the total domestic credit to the transport sector. Since 1999, total credit allocated to this sector has seen a general expansion at a decreasing rate. The construction sector has become the second largest receiver of total domestic credit to the private sector since 2000, totalling 21.6 percent and 24.0 percent in years 2000 and 2001, respectively. The second largest contributor to the GDP, the financial services sector, has consistently received the biggest share of the total domestic credit to the private sector. Although at an annual average declining rate of 3.6 percent over the last ten years, the financial institutions and other financial services sector have received between 33.4 percent (1992) and 23.3 percent (2001) of the total domestic credit to the private sector. Miscellaneous includes many industries like healthcare,

etc. and its share of the total domestic credit to the private sector has been on the rise since 1992, especially in 1999 when it almost doubled from 9.1 percent (1998) to 16.4 percent.

Stock Market Capitalization

The data set regarding the total stock market capitalization covers the same ten years as above. Ordinary shares of public companies have traded over-the-counter (OTC) before the establishment of the BISX in May 2000. As mentioned earlier, there are sixteen stocks that trade on the BISX and four that trade OTC. The pricing data for all stocks before May 2000 and currently OTC stocks are obtained from three major brokers, that also act as transfer agents, whereas pricing data for the BISX listed companies are provided by the BISX. The pricing information provided by the BISX reflects the last price that the security has traded at on the last date (or closest date to the last date) of the month whereas OTC pricing information averages at least two bid prices from at least two brokers on the last date of the month. Data regarding the number of total outstanding ordinary shares are obtained from audited company annual reports. Month-end market capitalisation is, therefore, calculated as a product of price and total outstanding ordinary shares as at the month-end in question. All prices and market capitalisations are in Bahamian dollars.

Graph 6a shows a general upward trend in the total stock market capitalization in The Bahamas in the last ten years. The share of total stock market capitalization over the GDP has also followed a steady upward trend since the early 1990s, moving from US$102.6 million (4% of GDP) in 1992 to US$1.7 billion (34% of GDP) by the end of 2002, peaking at $2.1 billion (41% of GDP) in April through June 2001. One should note that the total stock market capitalization, in this case, not only reflects the overall appreciation of ordinary shares of already public (either OTC or BISX listed) companies, but also the addition of values of ordinary shares of new public companies. In that regard, at the start of the data in January 1992, there were three[5] companies whose ordinary shares traded on the OTC market. By May 1995, this number had risen to eight. As at year-end 2002, there are twenty such companies. The sharp increase in total market capitalization from August to September 1997, for example, is chiefly due to the initial public offering (IPO) of one company which has contributed US$330 million to the total market capital. The last IPO added to the list of companies has occurred on May 2001, therefore, the end portion of the figure covering the four most recent months solely shows the changes in the values of the same group of companies under the effects of events such as September 11th, straw market fire, Hurricane Michelle of late 2001 as well as the general downward economic trend in the global markets.

---

5 Due to the lack of OTC pricing information, this paper had to exclude the contribution of one of these three companies (a banking institution) to the total market capital until April 1993, which is the earliest date pricing information is available.

Graph 6b shows the breakdown of total stock market capitalization by sector. The share of the banking sector over the total stock market capitalisation has grown from 39 percent to 64 percent whereas the share of the retail or distribution sector has severely fallen from first place with 61 percent in January 1992 to third place with 8 percent in August 2002. As at August 2002, the industrial, multimedia and insurance sectors constitute 10, 8, and 7 percent of the total stock market capitalization, respectively.

Public Debt Market Capitalization

Long-term

The monthly data set regarding the public bond market capitalization covers a period of ten years from January 1992 to December 2002. It comprises three main components: the Bahamas Government Registered Stock (BGRS), the Bahamas Mortgage Corporation (BMC) bonds and the Bridge Authority bonds. The BGRS and the Bridge Authority bond data are obtained from The Central Bank of The Bahamas which acts as the registrar and transfer agent of these issues. Data on the outstanding BMC bonds are taken from their quarterly reports. Graph 7 shows the trend and descriptive statistics of the public bond market capitalisation. Starting out at US$650.1 million (22.8% of GDP) in January 1992, the total public bond market capitalization follows a general upward trend until mid 1999, after which it is observed to be stabilising around US$1.4 billion (26.9% of GDP in December 2002). The biggest component of the public bond market, the BGRS, makes up between 84 percent (early 1990s) and 91 percent (since second quarter 2001) of the total public bond market capitalisation.

Short-Term or Money Market

The treasury bills with three-month maturities issued by The Bahamas Government make up the short-term public debt. From US$109 million (3.8% of GDP) in January 1992, the amount of treasury bills outstanding has risen to US$179.4 million (3.5% of GDP) in December 2002.

Future Prospects for Capital Markets Development in The Bahamas

While, over the years, the Bahamian capital markets have benefited from the changing financial and regulatory environment both domestically and internationally, several factors which globally play a discouraging role in the development of capital markets have been eliminated or their degree of influence diminished. For example, The Bahamas refrains from levying taxes on financial transactions involving the transfer of shares between two entities. In addition, there is no corporate income tax for Bahamian registered domestic companies or companies registered under the "International Business Company" (IBCs) status. In some countries, the existence of corporate income tax has been observed to be a daunting factor in the exchange listing decision process of a company, due to more detailed and frequent disclosure requirements of being listed on an exchange. Therefore, the no corporate income tax policy of The Bahamas may

have encouraged firms to list on the BISX with proper disclosure and filing. However, as an agent of investor protection, this policy puts additional pressure on the Securities Commission of The Bahamas to supervise the timely collection and the accuracy of required filings with the BISX, which is essentially a privately owned company. Currently, the Securities Exchange Act of 1999 requires exchange listed firms to file quarterly financial statements with the Securities Commission of The Bahamas. Also, interest rate ceilings of the 1980s, which limited the credit risk mitigation of the banks when lending, was abandoned in the early 1990s.

Recently, extensive studies have been undertaken by the World Bank, The Bahamas Chamber of Commerce, and the Bahamas International Securities Exchange (BISX) in collaboration with the Bahamian Government and The Central Bank of The Bahamas to identify the barriers to the development of the capital markets in The Bahamas. Specifically, the relatively small size of the domestic market, relatively low turnover, degree of marketing, status of Government securities, lack of offshore securities and the level of institutional investment are among the concerns. Many of these studies point to the same reoccurring themes that require action-taking and cooperation of the public and private sectors.

Therefore, although much effort has been made by both the public and private sectors towards a more efficient capital market in The Bahamas, several factors still remain to be improved. These factors may be categorised under nine main headings.

Trading of Bahamas Government Registered Stock

In recent years, the idea of a possible listing of government securities on the BISX has come up. While, presently, there are no indications of formal negotiations between the BISX and the Government, the effects of such an initiative on the functions and goals of the public bond market are worth examining.

Although government securities are absent from many of the region's securities exchanges such as the Eastern Caribbean Stock Exchange, Cayman Securities Exchange and Bermuda Securities Exchange, in other major securities exchanges like the National Stock Exchange of India and Tokyo Stock Exchange, government securities have been the initial building blocks.

A 1998 World Bank and Caribbean Centre for Monetary Studies (CCMS) study[6] on increasing competitiveness and financial resource management for economic growth in the wider Caribbean points out several other benefits of the role of well functioning government securities market in the development of a healthy financial sector.

---

6 World Bank and The Caribbean Centre for Monetary Studies, 1998. "Wider Caribbean Financial Sector Review: Increasing Competitiveness and Financial Resource Management for Economic Growth."

Raising funds on the free domestic market acts as a substitute and/or compliment to monetisation, which has undesirable effects such as inflation, allows the Central Bank to conduct open market operations with the existence of a "good" secondary market and serves as an indicator of government fiscal and monetary policy, essential information for the public confidence in government behaviour. If a domestic market for government securities is well functioning, there is less reliance on external borrowing. The higher the government debt in the international markets, the larger the default risk, which, in turn, implies greater premiums that the government has to pay over international rates. The country risk not only affects the government but also the private borrowing from the foreign markets in terms of increased interest rates for higher country risk. The Bahamas with its Moody's credit rating of A1 for long-term local currency sovereign debt is in a relatively good position compared to its English speaking Caribbean neighbours such as Jamaica with Ba2, Barbados with A3, and Trinidad and Tobago with Baa1.

International Recognition

The Bahamas has proven itself as a leader in the tourism sector and the offshore business; however, with its first stock exchange in its infant stage, it has yet to establish for itself a reputation as "the place to be listed". There is yet much ground to be covered by the BISX in order to obtain international recognition for the services it provides. In addition to not being included in various indices prepared by major international financial institutions, it is only recently that the Bahamian financial data are being reported by the major information sources such as Bloomberg. A study commissioned by the BISX and The Central Bank of The Bahamas has also found that there is a lack of participation in international marketing such as investment conferences and Bahamas-related overseas road shows. International recognition is certainly a must if the BISX is to develop its offshore listing business and compete with other stock exchanges in the Caribbean, such as the Cayman Securities Exchange, which specialize and have proven profitable in this area. In addition, the BISX does not enjoy the benefits of a designation such as that of the Bermuda Stock Exchange, which is a "designated offshore securities market"[7] under Regulation S of the Securities Exchange Commission in the United States.

Foreign Ownership

Two Acts passed during the time when The Bahamas was still a British colony, namely the Exchange Control Act of 1952 and the Exchange Control Regulations Act of 1956, give The Central Bank of The Bahamas the right to administer exchange controls. Although there have been some amendments to

---

7 That means that U. S. investors who purchase securities of a company listed on the Bermuda exchange may sell them on that exchange without regard to the minimum holding period and volume limitations that would otherwise apply to restricted securities under U.S. federal securities laws.

the articles towards improved efficiency and some moderate easing of the controls, all foreign exchange transactions by Bahamian residents require proper documentation and the approval of The Central Bank of The Bahamas. One of the implications of the exchange control regulations is the limitation of overseas investment choices available to the Bahamian citizens and, parallel to this, the limitations of domestic investment choices to non-Bahamian citizens. More specifically, according to the Exchange Control Regulations Act of 1956, 9(1):

> Except with the permission of the Controller, a security registered in the Colony shall not be transferred, and a security not so registered shall not be transferred in the Colony, unless, in either case, the following requirements are fulfilled, that is to say- neither the transferor nor the person, if any, for whom he is a nominee is resident outside the scheduled territories; and the transferor delivers to the transferee at or before the time of the transfer the prescribed declarations as to his residence and that of the person, if any, for whom he is a nominee; and neither the transferee not the person, if any, for whom he is to be a nominee is resident outside the scheduled territories.

In short, the paragraph above, coupled with the "25% investment premium" law, not only discourages the flow of capital outside The Bahamas by Bahamians, but also limits the flow of capital towards equity ownership on Bahamian soil by foreigners (including resident foreigners). Potential influx of capital from Bahamas resident foreigners, who make up approximately 18 percent of the population, constitutes a considerable amount that might be used to vitalise the trading volume on both the BISX listed and over-the-counter securities, which will have a positive effect on a more "accurate" pricing of the securities, as well as meet additional capital raising needs of listing companies. Even though it is a direct market intervention and discriminates among different kinds of investors in the same market, it might also be suggested that any concerns about foreign ownership can be dispelled by imposing restrictions on the percentage of shares that can be owned by a non-Bahamian.

Credit Bureau

There is no credit reporting system established in The Bahamas. The lack of a central system which institutions can use to check individual credit histories has been an issue caused by secrecy and confidentiality laws established by the Banks and Trust Companies Regulation Act of 2000. Apart from affecting everyday transactions, such as a car purchase, mortgage or a credit card application in the case of the consumer, it also has negative effects on the capital markets of The Bahamas. One example of that is that it make companies vulnerable to bad debt. Firms in the economy have very limited means of checking the credibility of their financial history, mostly in the form of employment letters, proof of ownership of property, bank statements, and word of mouth. There is no doubt that with a centralized credit reporting system, the decreased amount of paperwork and time spent to search and process these documents would result in greater efficiency in the processing of many financial transactions in the country. The

lack of a centralized credit reporting system also limits the introduction of financial investment products, such as receivable backed securities, that can be issued by companies and be listed on the BISX or be traded over the counter. The absence of a credit reporting system makes it almost impossible to rate debt which is backed directly not by assets but by the credit standing of the debtor.

Information Technology

The telecommunications industry in The Bahamas has come a long way since the early 1990s. In addition to basic telephone services, cable television with access to American broadcasting and high speed internet access provided by The Bahamas Telecommunications Corporation (BTC) and Cable Bahamas are among a few technological benefits enjoyed by many Bahamian residents living on the two major settlements, New Providence and Paradise Island and Grand Bahama. It is not the service or the hardware itself but rather the lack of competition in the communications industry that has acted as a barrier not only to the improvement of customer service but to the development of the capital markets. As a monopoly in both residential and commercial and mobile telephone service, the BTC has been able to charge rates that are above what is charged in the United States or in many Caribbean countries. Uncompetitive prices added to the cost of doing business in The Bahamas are sure to be a deterrent for many domestic and international companies wanting to establish or expand operations.

One of the technological developments in the pipeline is the implementation of a Real Time Gross Settlement (RTGS) system, which will modernize the current manual system of cheque clearing and create a medium for the development of electronic commerce. In the area of capital markets, it is expected that the implementation of RTGS is a step towards establishing a central depository and achieving delivery-versus-payment and will replace the current practice of writing cheques to brokers for the purchase of shares. The RTGS system is scheduled to be operational by April 1st, 2004.

Modernization of Government Services

Modernisation of government services is an essential part of any initiative that aimes to stimulate both domestic and international economic activity in the country.

Human Resources

At the base of every development problem lies the problem of lack of resources. In the case of capital markets development in The Bahamas, the type of resource is not natural, such as precious metals or water or fertile land, but human. According to most recent available data,[8] while the Bahamian workforce is blessed

8 Statistical Abstract (1999), Bahamas Department of Statistics.

with an army of over 135,000 persons, who are English-speaking and around twenty percent college educated, there is still a major need for human capital in highly sophisticated and specialised niche markets of the economy. As of 1997, the hotel and restaurant industry, together with wholesale and retail, made up a combined 30 percent (over 38,000 persons) of the total employed persons. The share of community, social and personal services in the labour force was 34 percent or over 43,000 persons. Construction and transport, storage and communication industries came in third with 9 percent (over 11,000 persons) of the labour force each. Eight percent (over 10,000 persons) of the labour force was employed in the finance, insurance, real estate and other business services. Although, unfortunately, the most recent data on the Bahamian labour force is more than four years old and further breakdown of the financial sector labour force by specialty is not available, several studies point to the lack of specialized personnel who can service the needs of specialised financial products such as derivatives and equity warrants. Such resources are a must if The Bahamas is to participate and compete in the offshore securities listing business.

Regional Integration

Globalisation is nothing new to the Bahamian economy. The Bahamas is host to more than 100,000 registered international business companies, almost 50 thousand foreign residents (18.4% of total population), and more than four million tourists a year. It imports about fifty percent of its Gross Domestic Product. In addition, in recent years, negotiations have started for membership or broadening of membership in the following organizations: Free Trade Area of the Americas (FTAA), World Trade Organization (WTO), and the Caribbean Community and Common Market (CARICOM).

While the Bahamian economy has been relatively open in terms of trade and capital investments, its stock market is restricted to a relatively small group of domestic investors. This, in turn, affects the volume of trading and liquidity of listed stocks on the BISX. Expanding the parameters of the stock exchange beyond Bahamian borders may have a positive effect on volume and liquidity of the BISX listed securities in terms of larger economies of scale. Although physical trade ties of goods and services are relatively small with the rest of the Caribbean, several comparable stock exchanges do exist in the region and the Bahamas securities exchange may consider a carefully structured integration with these comparable counterparts in the region to multilaterally expand the investor base and benefit from reduction in synergies.

Public Education

Public education efforts towards a more investment-savvy Bahamian population are likely to benefit the country's still developing capital markets. Although the National Insurance Fund has been relatively successful in bringing the average Bahamian into the capital markets arena, issues such as the relatively low rate of savings, level of knowledge of investment products and tools

may be exposed a wide range of the population (young or old, low income or affluent) to create a more confident Bahamian investor.

Summary and Conclusion

Capital markets are an integral part of any develop-ing or developed country. Their role evolves around different groups and matches those looking for funds with others looking to invest. Private individuals, the Government, government corporations, and private institutions all are participants in the capital markets of The Bahamas. These participants stand on different ends of the market and may take on the role of the investor or the fund-raiser at times. As regard the level of funding, private individual savings have grown parallel to economic expansion of the 1990s and early 2000s. The Government uses moderately the domestic financing channels and similar to private individual savings, public debt has expanded proportionately with GDP growth. On the government corporations' side, many seek funding entirely from the Government or are financed by the Government in part and the National Insurance Board in part. Privatization of certain government corporations, such as the Bahamas Telecommunications Company, is on the agenda. Institutional investment includes private pension funds, the National Insurance Fund, insurance companies and credit unions. The level of institutional investment is an emerging part of the overall investment in the country and outpaced the growth of the overall economy by almost 1.4 percent in the 1998-2001 period.

The Bahamas International Securities Exchange (BISX) is a private company founded in May 2000. Of the 16 listed domestic companies, the majority are in the banking sector. Under pressure from the small domestic market and lack of any offshore company listings, the BISX currently experiences low turnover, and hence low profitability.

Following the work of Khan and Senhadji (2000), this study identified four indicators of financial development which encompass the capital markets trends in The Bahamas. Three of the proxies used, domestic credit to the private sector, public bond market capitalization and Treasury bill capitalisation as shares of the GDP, showed relatively flat trends over the last ten years of data collected. The last proxy, stock market capitalisation as a percentage of the GDP revealed a much different pattern, an upward trend that folded almost eight times in the course of a decade, owing to inclusion of new listings on the BISX and increased flow of funds from institutional and private investors, especially in the late 1990s, the same period that corresponds to the stock market bubble and rapid economic expansion in the United States.

Finally, the study makes nine recommendations for the improvement of capital markets in The Bahamas. They include the trading of The Bahamas Government Registered Stock, the modernisation of government services, the establishment of a credit bureau, improved conditions for foreign ownership of shares, as well as striving for international recognition, regional integration, human resource development, and better information technology and public education. Indeed, these recommended actions, if undertaken by the public and private sectors, could lead to a better functioning and more protected market, with a larger and more knowledgeable investor base.

References

Bahamas Development Bank. 2001. *Bahamas Development Bank Annual Report 2000.* Nassau, Bahamas.

Bahamas International Securities Exchange. 1999. Private Placement Offering Memorandum. September. p. 12.

_____. 2002. Retrieved on 9th August, 2006, from: http://www.bisxbahamas.com/index.lasso

Beck, T., Demirgüç-Kunt, A. and R. Levine. 1999. *A New Database on Financial Development and Structure.* The World Working Paper No. 2146

Central Bank of The Bahamas. 2003a. *Quarterly Statistical Digest.* Vol. 12, no. 4.

_____. 2003b. *Quarterly Economic Review.* June.

Department of Statistics. 2003. *Statistical Abstract.* Nassau, Bahamas: Government of The Bahamas.

Demirgüç-Kunt, A. and V. Maksimovic. 1996. *Capital Structures in Developing Countries: Evidence From Ten Countries.* The World Bank Working Paper No. 1320.

Government of The Bahamas. 1998. *Bridge Authority Act.* Retrieved on 9th August, 2006, from: http://laws.bahamas.gov.bs/statutes/statute_CHAPTER_267.html

_____. 1956. *Exchange Control Regulations Act.* Retrieved on 9th August, 2006 from: http://laws.bahamas.gov.bs/statutes/statute_CHAPTER_360.html

_____. 1999. *Securities Industry Act.* Retrieved on 9th August, 2006, from: http://laws.bahamas.gov.bs/statutes/statute_CHAPTER_363.html

Khan, M. and A. Senhadji. 2000. *Financial Development and Economic Growth: An Overview.* IMF Working Paper.

King, R. and R. Levine. 1993. Finance, Entrepreneurship, and Growth: Theory and Evidence. *Journal of Monetary Economics*, Vol. 32, no. 3.

McKinnon, R. 1973. *Money and Capital in Economic Development.* Washington, D.C.: Brookings Institute.

Ministry of Finance. 2003. *2003/2004 Budget Communication.* Nassau, Bahamas: Government of The Bahamas.

U.S. Securities and Exchange Commission. April 18, 2005. *Regulation SHO.* Retrieved on 9th August, 2006, from: http://www.sec.gov/answers/regsho.htm

World Bank and the Caribbean Centre for Monetary Studies. 1998. *Wider Caribbean Financial Sector Review: Increasing Competitiveness and Financial Resource Management for Economic Growth.*

Appendix

Table 1
Institutional Domestic Assets

	1998	2000	2001	1998	2000	2001
	(B$ millions)			(% of GDP)		
Private Pension Funds	628.6	763.3	793.5	15.0	15.5	16.1
National Insurance Fund	746.2	959.4	991.5	17.8	19.5	20.2
Insurance Companies	483.0	593.6	648.7	11.5	12.1	13.2
Credit Unions	87.2	110.9	120.4	2.1	2.3	2.4

Source: Central Bank of the Bahamas, Quarterly Economic Review.

Table 2
Stock Exchange Indicators

Exchange	Year of Establish-ment	Market Capitalisation B$ Billion	Number of Securities Listed
BISX	2000	1.7	16
BSX	1971	125.0	290
CSX	1997	38.2	700
ECSE	2001	0.1	2
JSE	1968	5.9	39
TTSE	1981	7.8	33

Source: Securities Websites.

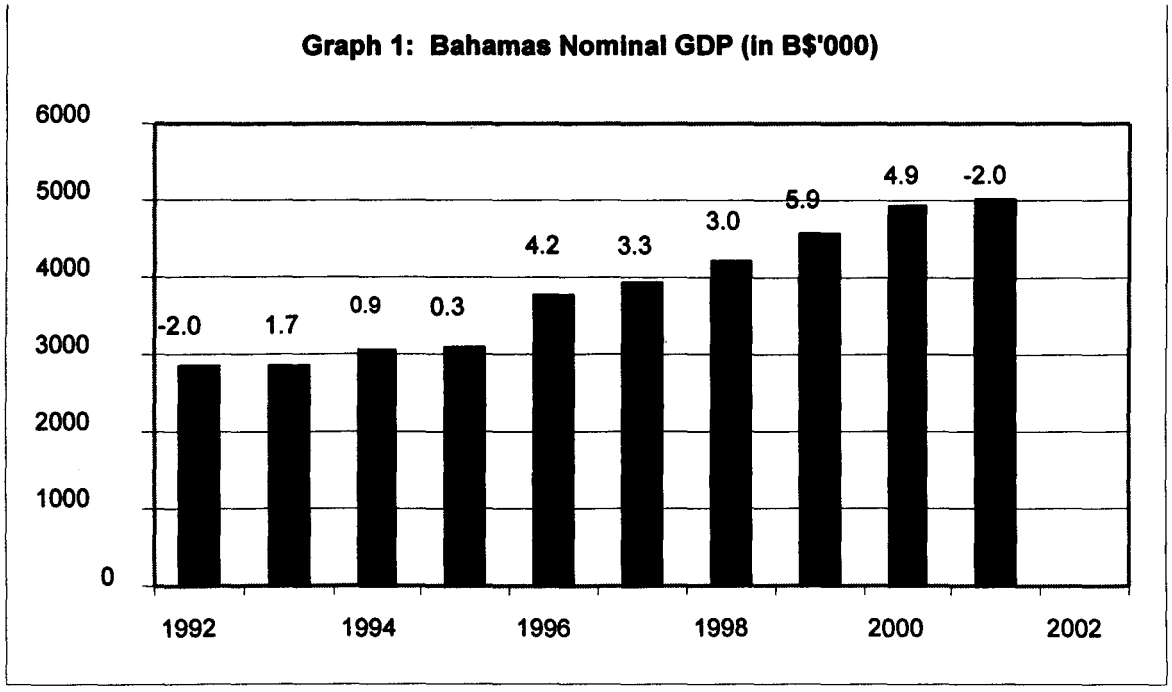
Table 3. Total Domestic Credit to the Private Sector by Industry (BDS$)

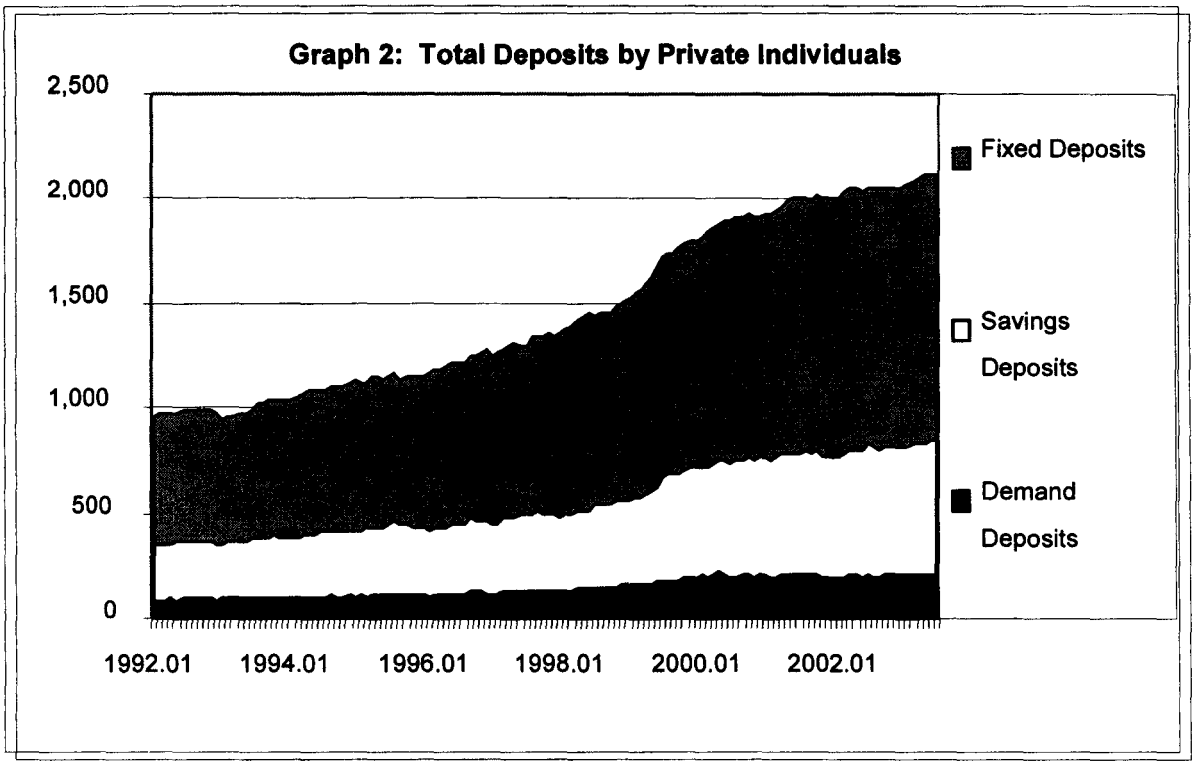
Industry	1992	1993	1994	1995	1996	1997
Agriculture, Fisheries, Mining and Quarrying	1,999,548	245,080	275,339	320,639	360,143	384,139
Construction	964,397	1,111,596	1,281,507	1,191,797	1,193,160	1,339,505
Distribution	1,576,152	1,570,346	1,682,686	1,744,667	1,897,438	1,911,458
Financial Institutions and Other Financial Services	21,777,791	2,358,159	2,433,329	2,447,624	2,878,344	3,138,722
Manufacturing	376,921	368,540	421,847	446,770	471,737	464,344
Misc.	416,667	504,891	608,773	699,445	803,306	883,683
Tourism, Entertainment & Catering	610,021	618,042	691,930	735,867	758,980	637,873
Transport	206,461	212,691	225,571	262,780	276,795	260,390
Total	6,527,958	6,989,345	7,620,982	7,849,589	8,639,903	9,020,114

Table 3. Total Domestic Credit to the Private Sector by Industry (BDS$) - Cont'd

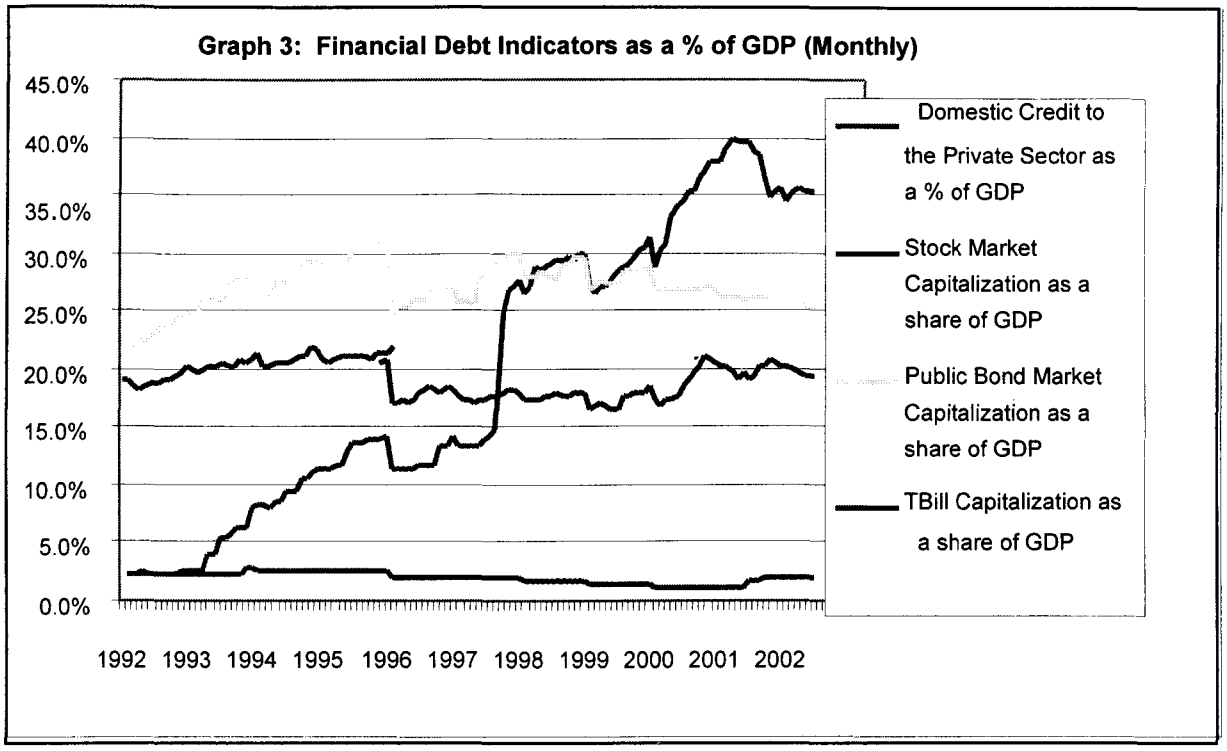
Industry	1998	1999	2000	2001	2002
Agriculture, Fisheries, Mining & Quarrying	401,371	393,004	330,566	325,061	286,567
Construction	1,579,857	1,785,272	2,588,881	3,081,661	3,205,007
Distribution	2,077,968	2,000,596	2,199,468	2,598,729	2,578,703
Financial Institutions and Other Financial Services	3,273,019	2,950,740	2,953,240	2,987,137	3,064,775
Manufacturing	504,244	483,377	464,771	469,919	444,046
Misc.	874,552	1,684,230	2,279,739	2,031,055	2,196,748
Tourism, Entertainment and Catering	642,824	759,486	921,433	1,004,885	849,376
Transport	239,208	233,648	243,669	316,554	265,130
Total	9,593,043	10,290,353	11,981,767	12,815,001	12,890,352

Source: Central Bank of Barbados, Economic and Financial Statistics.



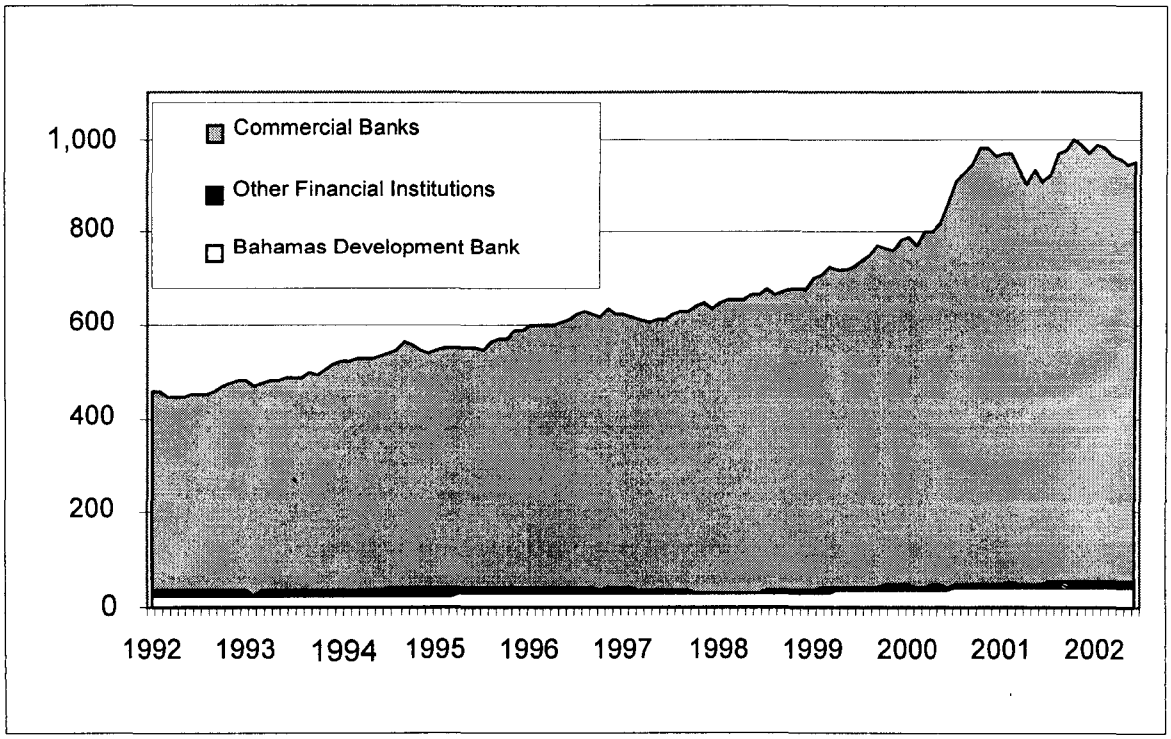


Source: Central Bank of The Bahamas.

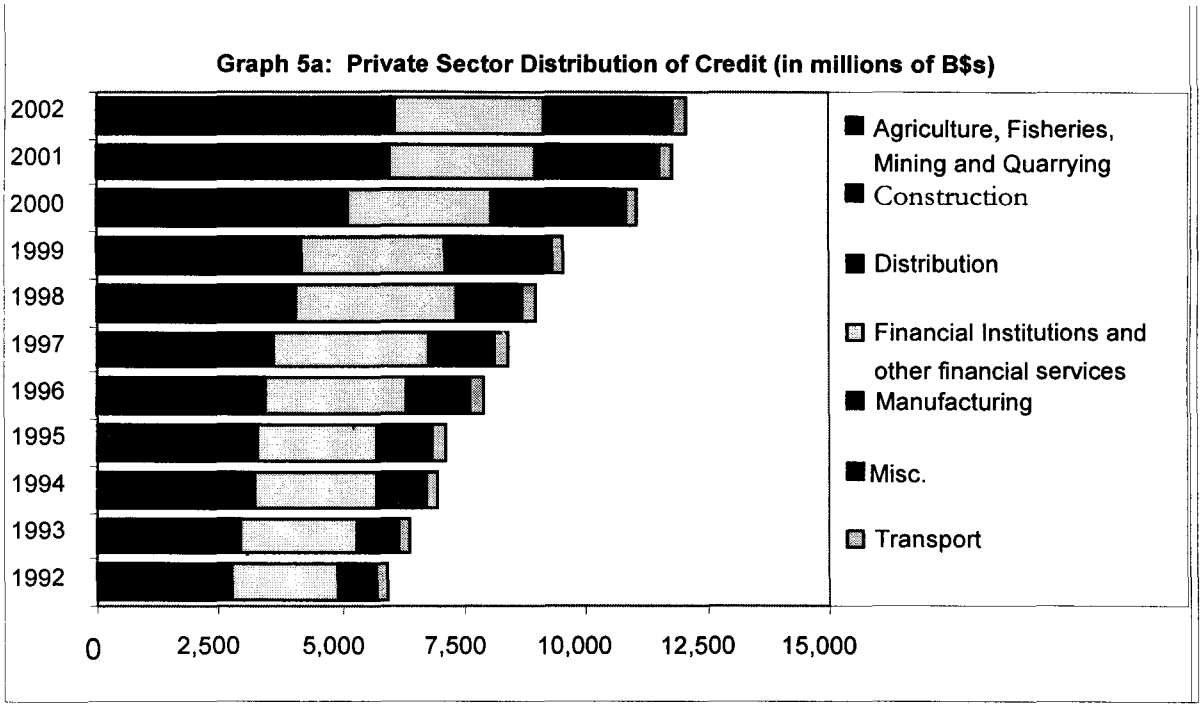


Source: Central Bank of the Bahamas, Bahamas Mortgage Corporation.

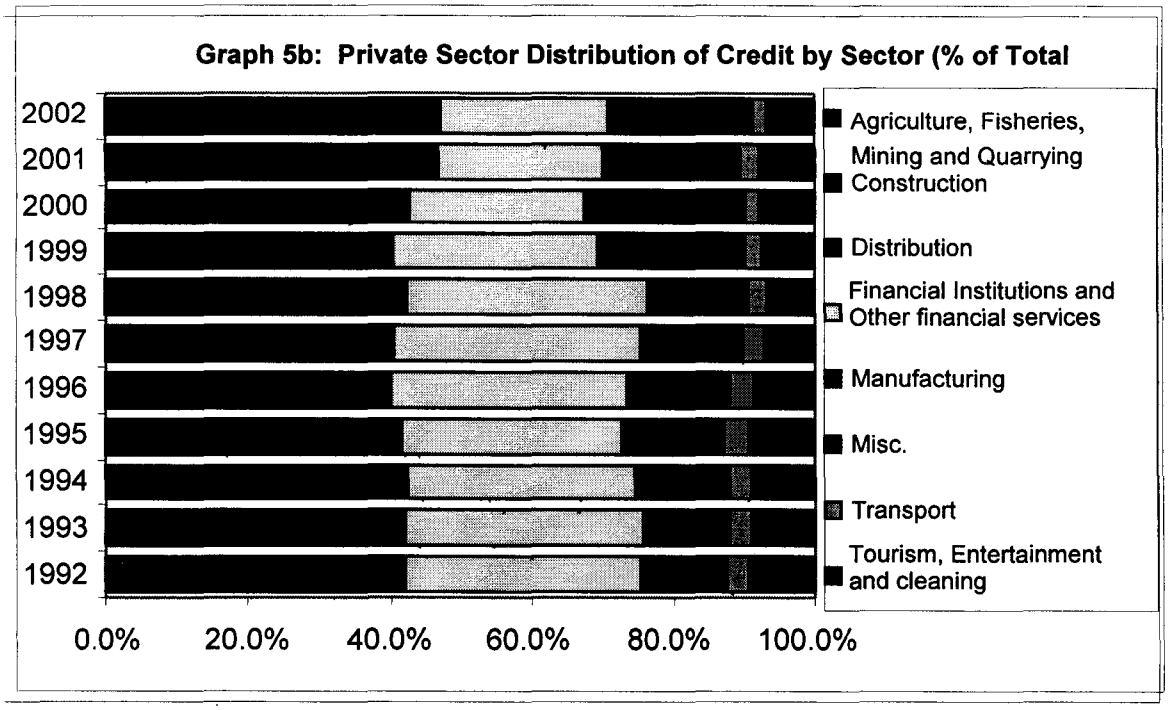
Graph 4: Domestic Credit to Private Sector by Institution



Source: Central Bank of the Bahamas.

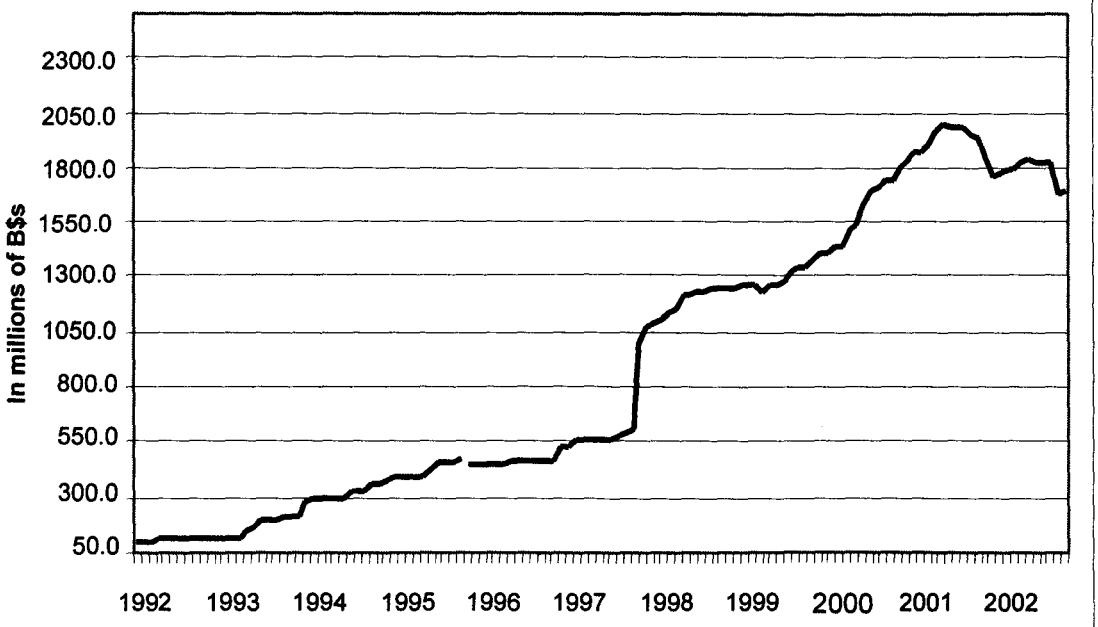


Source: Central Bank of the Bahamas.



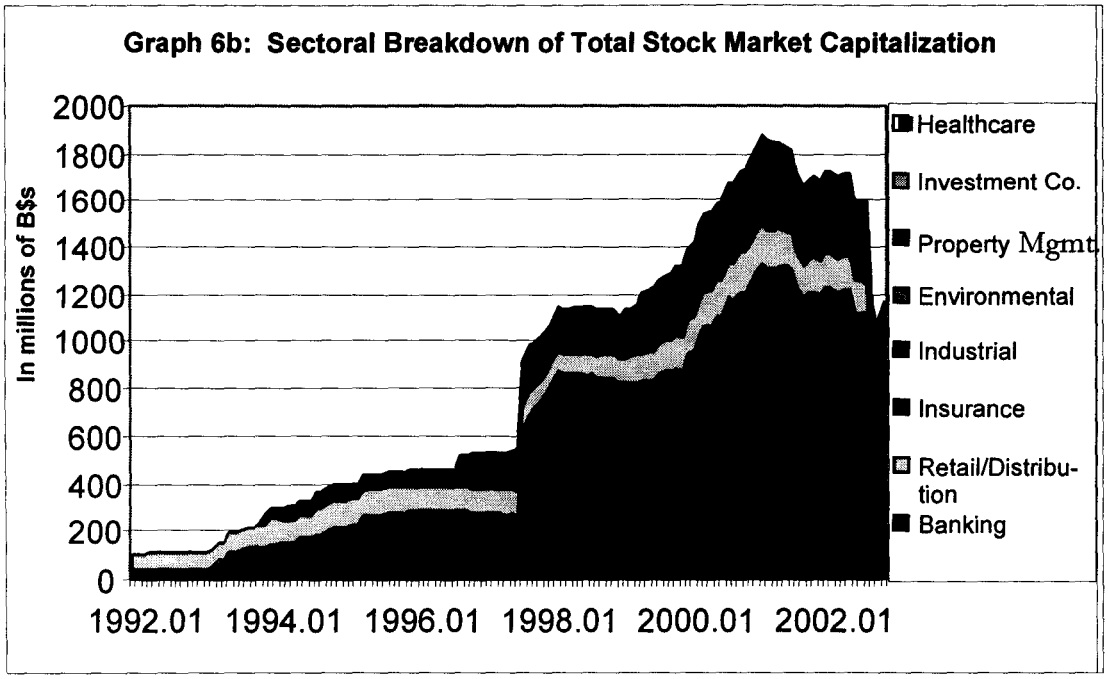
Source: Central Bank of the Bahamas.

Graph 6a: Bahamian Total Stock Market Capitalization

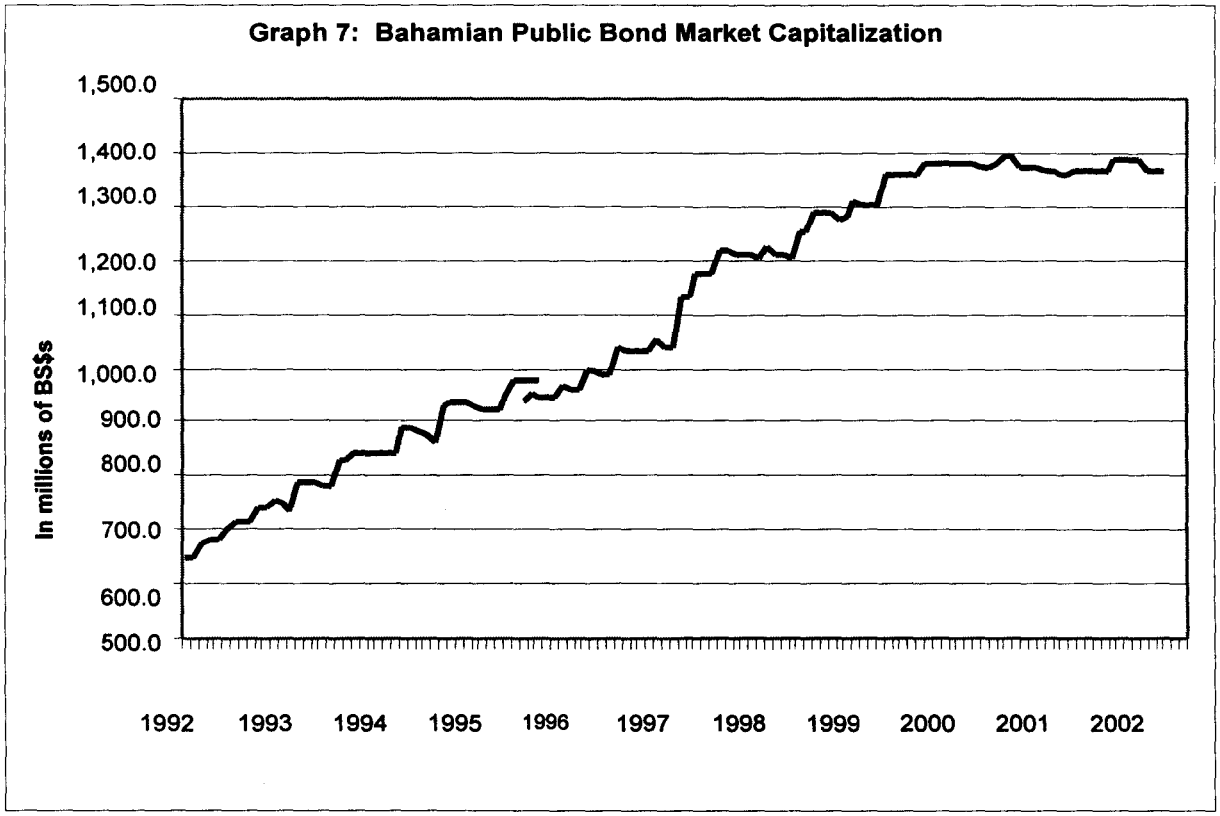


Source: Various Annual Reports and Market Data provided by BISX, SG Hambros, Fidelity, Colina.

Graph 6b: Sectoral Breakdown of Total Stock Market Capitalization



Source: Various Annual Reports and Market Data provided by BISX, SG Hambros, Fidelity, Colina.



Source: Central Bank of the Bahamas, Bahamas Mortgage Corporation.

20

Financial Market Integration, Arbitrage and Interest Rate Parity in the Caribbean

Anthony Birchwood & Dave Seerattan

Abstract

The study utilises the framework of uncovered interest rate parity (UIP) to examine whether the liberalisation of the capital market in three Caribbean countries has led to the increased integration of their money markets, and greater integration with the US money market. The paper also investigates the arbitrage opportunities that exist between the three regional money markets and that of the US. The results indicate that UIP does not hold between the regional economies and the US. Moreover, among the three territories examined, significant arbitrage opportunities were found to exist with respect to short-term investment opportunities in Jamaica and for investors in Guyana and Trinidad and Tobago. The high correlation of returns at the short end of the money markets, however, militates against the optimal diversification of risks regionally.

Introduction

Theoretically, rational investors in open financial systems could exploit arbitrage opportunities created by the differential rates of return on similar assets in different jurisdictions,[1] which leads to the convergence of rates and the acceleration of the integration of financial markets.

When arbitrage does not occur, some interesting issues arise. For example, is it because of high transactions costs or is the exchange rate risk premium too large? Are agents too risk-averse to exploit these arbitrage opportunities? How are expectations formed about future movements in the exchange rate in these jurisdictions? These questions are important from a policy perspective. In particular, they have implications for the ability of the domestic authorities to tax financial activity and the ability of the monetary authorities to conduct

1 This assumes that equivalent financial assets in different countries are close substitutes and the major differences relate to the interest rate and currency denomination. It also presupposes that there are no significant transactions costs and capital controls.

independent monetary policy. These develop-ments also have implications for the complexity of regulating and supervising financial activity to prevent financial instability.

These issues have generally been well ventilated in developed market economies, but have not yet received similar attention in the Caribbean. This paper attempts to fill this gap by reviewing the arbitrage opportunities available at the short end of the money markets of Guyana, Jamaica and Trinidad and Tobago,[2] the degree of convergence between foreign interest rates and domestic rates in these countries, using the framework of Uncovered Interest Parity (UIP) and the decomposition of the factors that drive interest parity or the lack thereof.

The paper has six sections. Section 2 reviews the relevant literature. This is followed in Section 3 by a discussion of the theoretical framework. Section 4 discusses the methodology, and in the next section the results are presented. Some conclusions are drawn in Section 6.

A Review of the Literature

Uncovered interest parity (UIP) is an important area in international finance, serving as the basis for many theoretical models, including the balance of payments (Williamson, 1983) and exchange rates (Frankel, 1979; Flood and Garber, 1984). UIP posits that the expected change in the spot exchange rate is driven by current interest rate differentials between the countries in question. This model assumes that foreign exchange markets are perfect, which implies that agents are risk-neutral and expectations are formed rationally. It also presupposes that the securities markets are perfect with no transactions costs, taxes or capital controls. Equivalent financial assets in different countries are, therefore, the same except for the interest rate and the currency denomination. In these conditions, arbitrage will tend to equalise any differential in interest rates between countries.

UIP has many policy implications, chief among these being that sterilised foreign exchange interventions would be relatively ineffective if UIP holds (Taylor, 1995). This is because attempts to change the prevailing spot exchange rate relative to the expected future spot rate would result in countervailing interest rate changes. Interest rate defence of currencies under speculative pressures would similarly be ineffective (Flood and Rose, 2001). Deviation from UIP is, therefore, a necessary condition for these policy initiatives to work. UIP also has implications for the forecasting of nominal exchange rates, since in an efficient market the nominal interest rate differential should be equal to the expected change in the nominal exchange rate (Bleaney and Laxton, 2003).

More importantly, UIP assumes that expected interest rates on equivalent local and foreign securities would tend to converge (when the spot exchange rate between two countries is factored in) as market participants seek to exploit arbitrage opportunities. A failure of this condition implies a number of possibilities.

---

2 The focus is not on the long end of the market since information is scarce due to the relatively underdeveloped nature of this section of the market and the related infrequency of transactions.

For example, foreign securities may be imperfect substitutes and agents need to be compensated for higher risks associated with these securities. It may also indicate markets are not efficient and that there are significant transactions costs which prevent arbitrage from operating efficiently to drive interest rate convergence and then parity.

Given the importance of UIP in international finance, many studies have sought to test whether this theory or its real counterpart, real interest rate parity (RIP), holds. Most studies have been unable to show that the relationship exists (Davidson, 1985; Loopesko, 1984; Hodrick, 1987; MacDonald and Taylor, 1992) while some authors have been more supportive (Meredith and Chinn, 1998; Flood and Rose, 2001; Moosa and Bhatti, 1996; Bleaney and Laxton, 2003; Wu and Fontas, 2000).

For studies in which UIP failed to hold,[3] many concluded that a significant constant or time-varying premia existed and thus frustrated the achievement of parity (Froot and Frankel, 1989; Frankel and Chinn, 1993). Other reasons advanced for the failure of this condition include the so-called "peso" problem (Krasker, 1980), a simultaneity bias driven by the dynamic of the actions of the monetary policy authority (McCallum, 1994), incomplete information and the process of rational learning where repeated "mistakes" are made (Lewis, 1988; 1989) and self-fulfilling prophecies of rational agents or rational "bubbles" (Flood and Hodrick, 1990; Mussa, 1990; Obstfeld and Rogoff, 1986).

The risk premium bias argument posits that constant or time varying risk premium in the foreign exchange market exists, which frustrates interest parity. The literature that explores this reason for the failure of UIP generally focuses on building conceptual models of the risk premium, as defined by the deviation from UIP. This approach often concludes that the prediction bias, which causes the failure of the UIP condition to hold, is really an omitted variable problem that can be addressed by including a behavioural model of the risk premium on the right hand side of the UIP equation. The "peso" problem reason for the failure of UIP draws its name from an episode of prolonged forward discount before its widely anticipated devaluation in 1976. Essentially, this event illustrates that even if expectations are formed rationally, the forward rate can still be a biased predictor of the future spot rate in finite samples because agents expect the rate to change in response to policy or some other event which fails to materialize over a fairly long period.

Another explanation for the failure of UIP involves the failure to simultaneously estimate a related relationship between interest rate differentials and exchange rates driven by the dynamics of the short-term foreign exchange market interventions of the monetary authorities. This seems to be corroborated by the evidence of a statistically significant but incorrect signed relationship between the change in exchange rates and the level of foreign exchange market intervention, which implies a simultaneity bias (Dominguez and Frankel, 1993).

---

3 The majority of empirical studies have indicated that UIP does not hold. Moreover, the results of many of these studies are opposite to those posited by UIP (Froot and Thaler, 1990).

A fourth explanation for the failure of UIP is that market participants lack adequate information and are engaged in a process of rational learning about factors which impact on the behaviour of exchange rates. Agents may, therefore, act rationally on information available at time *t* to make forecasts of exchange rates at time *t+1*, but because they need to learn continuously as market conditions change, mistakes are repeated. A fifth reason relates to the notion of self-fulfilling prophecies of rational agents but few believe it to have much plausibility where empirical work is concerned. The theoretical possibility of rational "bubbles" reflects the fact that many rational expectations models have indeterminacies which generate multiple equilibria and, in the case of exchange rate behaviour models, infinite numbers of solutions for the time-path of the exchange rate. The fact that the time-path of forward forecast errors do not explode over time suggests, however, that rational bubbles are an unlikely explanation of the forward prediction bias and a reason for the failure of UIP.

In studies where interest rate parity was found, attempts were made to deal with some of these methodological weaknesses. For example, Wu and Fountas (2000) attempted to account for stationarity and structural breaks, where long-term interest rates were used instead of short term rates since the latter are more contaminated by monetary policy initiatives which could frustrate parity, especially when testing between countries that react differently to the same shocks (Meredith and Chinn, 1998) and when more credible proxies for the expected exchange rate are used (King, 1998).

Moreover, the vast majority of studies investigating the existence of UIP are based on developed market economies, which generally have low inflation and floating exchange rate regimes. UIP may, however, work differently in countries where interest and exchange rates are much more volatile. UIP may also become more relevant as financial markets deepen and as agents become more sophisticated and comfortable engaging in arbitrage across borders. In fact, Flood and Rose (2001) find that "while UIP still does not work well it works better than it used to", indicating that the objective conditions needed for UIP to hold have increasingly reached closer to what is required.

Many of these studies, however, suffer from methodological deficiencies, such as additional assumptions being imposed on the UIP conditions, the proxy used for expected exchange rates (rational expectations are assumed and the current exchange rate is used for the expected exchange rate) and because of the econometric methods such as the failure to deal with the issue of stationarity and to account for structural breaks in the testing procedure (King, 1998).

In this context, this paper examines whether UIP between three Caribbean economies (Guyana, Trinidad and Tobago and Jamaica) and the US holds, with respect to the money market. In particular, those territories that have liberalized their financial systems, both in terms of eliminating restrictions on capital flows and adopting flexible exchange rate regimes, are used in the analysis, since the issue has serious policy implications for these jurisdictions. These issues include the scope for independent monetary policy, the effectiveness of interventions in the foreign exchange market and the actual degree of capital mobility. The investigation of the UIP condition also helps to shed light on the convergence of rates and the factors that may be of influence in this regard.

Theoretical Framework

As mentioned before, UIP is based on the proposition that if domestic interest rates are not equal to agents' expected returns on equivalent foreign securities, then they will borrow at the relatively low interest rates and invest the proceeds at the relatively high rate until the two are equalised.

Formally, the notion of UIP can be stated as follows. Assume that i_t and i_t^* are the interest rates that can be earned between time t and $t+1$ on local currency investments in countries A and B, respectively. Also let S_t and F_t be the spot and forward exchange rate between the currencies of the two countries. The uncovered version of the interest parity condition considers the option of holding investments denominated units of currency B and converting it into currency A at the spot exchange rate that prevails at time $t+1$. This investment decision would lead to an accumulation of $S_{t+1}(1+i_t^*)$ units of currency A. The important distinction of this investment option is that the investor remains uncertain about the exchange rate until the day of conversion. This means that the foreign exchange risk is left **uncovered** during the period between times t and $t+1$.

The UIP model posits that market forces (arbitrage) will work to equalise the return that investors expect to earn on the uncovered investment alternative with the return on the no-risk option of converting into currency A initially, the version of the interest parity condition where the exchange rate risk is **covered**. In particular, if the expected value at time t of the spot exchange rate at time $t+1$ can be expressed as E_tS_{t+1}, the UIP model can be expressed as

$$E_tS_{t+1}(1+i_t^*) = S_t(1+i_t) \qquad (1)$$

Taking logs (indicated by lower case letters) and rearranging gives,

$$E_tS_{t+1} - S_t = r_t = r_t^* \qquad (2)$$

where r_t and r_t^* are the domestic $(1+i_t)$ and foreign $(1+i_t^*)$ rates of return on equivalent securities in different countries at time t. Equation (2) is the risk-free arbitrage condition that holds irrespective of the preferences of investors. The absence of reliable data on expectations of future exchange rate movements means, however, the inability to formally test the proposition in this form. If one assumes that investors are risk-neutral and they form their expectations of future exchange rates rationally, the expected future spot exchange rate can be regarded as an unbiased predictor of the actual future spot rate. If rational expectations hold, then future realisations of the spot rate will equal the actual spot rate at time t plus a white noise error term, which is uncorrelated with information known at time t.

$$s_{t+1} = E_ts_{t+1} + u_{t+1} \qquad (3)$$

where u_{t+1} denotes the error term. Substituting (3) into (2) gives:

$$S_{t+1} - S_t = r_t = r_t^* + u_{t+1} \quad (4)$$

which can also be expressed as

$$\Delta S_{t,t+1} = r_t - r_t^* + u_{t+1} \quad (5)$$

Equation (5) embodies the UIP proposition when investors are risk-neutral and expectations are formed rationally. In effect, therefore, one is testing the UIP proposition jointly with the assumption of rational expectations in the foreign exchange markets, which is done via the equation:

$$\Delta S_{t,t+1} = b_0 + b_1(r_t - r_t^*) + u_{t+1} \quad (6)$$

Under the assumption of rational expectations, the error terms are serially uncorrelated and have zero means. The null hypothesis of UIP (sometimes called the "unbiasedness hypothesis") can then be expressed as $b_0=0$, $b_1=1$. In practice, however, most of the literature has focused on b_1, since this gives an idea of the degree of proportionality between exchange rate changes and interest rate differentials.

As discussed above, where UIP has failed, many attribute the failure to risk premia, directing attention to building conceptual models of the risk premium, generally defined as the deviation from UIP, that is, taking from (2) above, instead of $E_t s_{t+1} - s_t - r_t + r_{t*} = 0$ which indicates that if UIP does not hold, there is,

$$E_t s_{t+1} - s_t - r_t + r_{t*} = \rho_t \quad (7)$$

implying that UIP is frustrated by a risk premium, r_t , or

$$E_t s_{t+1} - s_t = r_t + r_{t*} = \rho_t \quad (8)$$

Following steps (3) through (6) gives

$$\Delta s_{t,t+1} = b_0 + b_1 - (r_t - r_t^*) + \rho_t + u_{t+1} \quad (9)$$

Equation (8) suggests that the failure to find UIP may be due to an omitted variable problem, which could be solved by extending the right-hand side of the model to include a behavioral model of ρ_t.

Boulos and Swanson (1994) argue that factors such as transactions costs, tax effects, liquidity premiums and/or measurement errors drive the risk premium, while Flood and Rose (2001) indicate that exchange rate and interest rate volatility may be significant determinants of the risk premium. Therefore, the risk premium is modelled as:

$$\rho = f(er_v, i_v, tr, liq) \qquad (10)$$

where er_v is the volatility of exchange rates, i_v is the volatility of domestic treasury bill rate tr is transaction costs, and liq is the excess liquidity in the case of Guyana and Jamaica, and excess reserves in the case of Trinidad and Tobago.

Volatility in exchange rates can trigger the use by the monetary authorities of higher interest rates to defend the currency. Unstable domestic interest rates may encourage investors to seek a higher premium in order to invest in the locally denominated asset. The transaction cost variable is the difference between the bid and ask price of the exchange rate. This variable is used to capture inefficiencies in the currency market, so that the wider the difference, the greater the risk premium demanded by investors. The excess liquidity is used to capture the prevailing monetary context. High excess liquidity is expected to exert downward pressure on domestic interest rates and therefore narrow the spread, where local rates were already higher than the foreign rates.

The volatility of the exchange rate and the treasury bill rate was computed as a moving standard deviation according to the general maturity profile of the treasury bill considered. For example, the volatility of a 3-month treasury bill rate was calculated by taking the standard deviation over the last three months, for each successive rate. A similar estimation was done for the exchange rate.

Methodology

For the purposes of this study, the empirical methodology centres around the investigation of three concerns: (1) tests for uncovered interest rate parity, (2) tests for convergence of risk premia in the regional money markets, and (3) exploration of the factors generating risk premia.

Test for the long-run uncovered interest rate parity

Equation (6) forms the basis of the tests of interest rate parity. A challenge in conducting such tests is the determination of the forward rate. In all countries, the time horizon for the forecast of the forward rate is set to coincide with the maturity of the Treasury bill being normally considered. For example, the forward exchange rate when considering a 3-month Treasury bill is set at the corresponding three months. In Guyana and Trinidad and Tobago, the three-month Treasury bills are considered, so that the forward rate is forecast for a 3-month horizon. However, in Jamaica, the 6-month Treasury bill is used, and the forward rate is set at a 6-month horizon. These instruments were selected because of the frequency with which they are traded in the respective markets, compared to other maturities. Agents are assumed to be rational, so that the actual exchange rate at the end of the forecast horizon is postulated to be correctly forecast. The equation is estimated by Ordinary Least Squares (OLS), provided that the terms are I(0). If, however, the variables are I(1), then the cointegration methodology is considered.

Tests for convergence of the risk premia in the regional money markets

The risk premia are calculated using Equation (7). The convergence of the risk premia was examined by finding the significance of the differences in risk and returns between markets, and the long-run association of returns. The significance of the differences is tested through the use of ANOVA. Returns are measured in terms of the risk premia, while the volatility of the returns is measured by the standard deviation of the risk premia of the series for each country. Following this, the returns are tested for cointegration.

Exploration of the factors generating risk premia

The functional relation in Equation (10) is analysed principally through the use of impulse response functions, to examine their impact on the risk premia, of a one standard deviation shock on current and future values of the other endogenous variables. The impact is shown both incrementally and cumulatively for different short-term horizons, in order to study the importance of the explanatory factors.

The frequency of the data is monthly for Guyana and Jamaica, but bi-weekly for Trinidad and Tobago. The data series for both Guyana and Jamaica are from January 1994 to June 2003. In the case of Trinidad and Tobago, the data series covers the period January 2000 to June 2003.

Results

Tests for Interest Rate Parity

One criticism of earlier studies is the use of classical regression techniques which ignore the stochastic nature of the variables under study.[4] Indeed, non-stationarity in the error term will cause OLS estimates to be inconsistent and the standard tests will not be based on the appropriate distributions. As a preliminary step, therefore, the stochastic properties of the spreads were investigated by establishing their order of integration. Where both the exchange rate and interest rate spreads were found to be I(0), then OLS estimation was used. However, if these variables were both I(1), then the spreads were tested for cointegration. Unit root tests were conducted using the tests recommended by Dickey and Fuller (1981) and Phillips and Perron (1988). Both tests produced similar results so that only the results of the ADF are reported.

Both terms were I(0) only in the case of Guyana (see Table 1). An attempt was therefore made to test for interest rate parity using OLS. The initial regression showed a very low R^2 (see Table 2). Moreover, the regression exhibited higher order serial correlation. Despite the fact that the serial correlation problem was reduced by the addition of the AR(2) term, the main parameter of interest, β, was not close to unity. Thus the interest rate parity condition was rejected for Guyana.

---

4 See for example, Mishkin (1984) and Gaab, Granziol and Horner (1986).

Table 1. Unit Root Tests

	Level Series			1st Dif		
	C	C&T	NCT	C	C&T	NCT
Guyana						
$er_{t+3} - er_t$	-4.2***(2)	-4.2***(2)	-3.9***(2)			
$i_t - i_t^*$	-2.7*(0)	-2.2(0)	-2.0*(0)		-9.4***(0)	
Jamaica						
$er_{t+6} - er_t$	-3.57***(0)	-1.26(6)	-2.6**(1)		-7.0***(0)	
$i_t - i_t^*$	0.75(0)	-0.34(1)	1.6(0)	-7.3***(0)	-7.4***(0)	-7.2***(0)
Trinidad and Tobago						
$er_{t+3} - er_t$	-3.2**(3)	-3.2*(3)	-3.2***(3)			
$i_t - i_t^*$	-0.68(0)	-2.83(0)	0.85(0)	-11.4***(0)	-11.4***(0)	-11.3***(0)
Risk Premia						
ρ_{Guyana}	-1.31(1)	-2.4(1)	0.49	-4.31***(0)	-4.3***(0)	-4.3***(0)
$\rho_{Jamaica}$	-0.14	-3.22*(1)	2.06(0)	-4.06(0)***		-3.71***(0)
$\rho_{T\&T}$	-0.79(0)	-2.94(0)	0.84(0)	-7.29(0)***	-7.23***(0)	-7.05***(0)

Notes: The variables in parentheses represent the lag length selected, which was determined through the use of the Schwarz information criterion (SC). C is a constant, C&T is a constant and time trend, and NCT is a no constant and time trend.

*** is significant at a 1 per cent level,
** is significant at a 5 per cent level, and
* is significant at a 1 per cent level.

Table 2
Tests of the Interest Parity Condition in Guyana.

$\hat{\alpha}$	$\hat{\beta}$	AR(1)	AR(2)	DW	R^2
0.0163	-0.008			0.239	0.012
0.0118	-0.004	1.3104***	-0.5013***	1.9113	0.84

Notes: The dependent variable is the spread between the forward and spot exchange rates.

*** is significant at a 1 per cent level,
** is significant at a 5 per cent level, and
* is significant at a 10 per cent level.

The interest rate differential was I(1) in Jamaica and Trinidad and Tobago, while the spread between the forward and spot rates in both countries was found to be I(0). The variables were not cointegrated, therefore rejecting the hypothesis that there was a long-run relationship between both terms. The evidence, therefore, did not support the hypothesis of interest rate parity between the US and these countries.

The rejection of the interest rate parity in all three countries suggests that there is significant risk premia associated with these markets. Figure 1 shows the level of risk premia associated with these markets over the common period January 2000 to March 2003. The premia were tested between all three markets to determine whether there was any significant difference between returns and volatility. The ANOVA results suggest that returns in the Jamaican market are significantly higher than in Guyana and in Trinidad and Tobago (see Table 3). In fact, there was no significant difference in the returns emanating from the money markets in the latter two countries. Additionally, the volatility of returns was greater in Jamaica than in the other two territories, thereby suggesting a positive relation between risk and return between the three territories.

Figure 1

Risk Premium

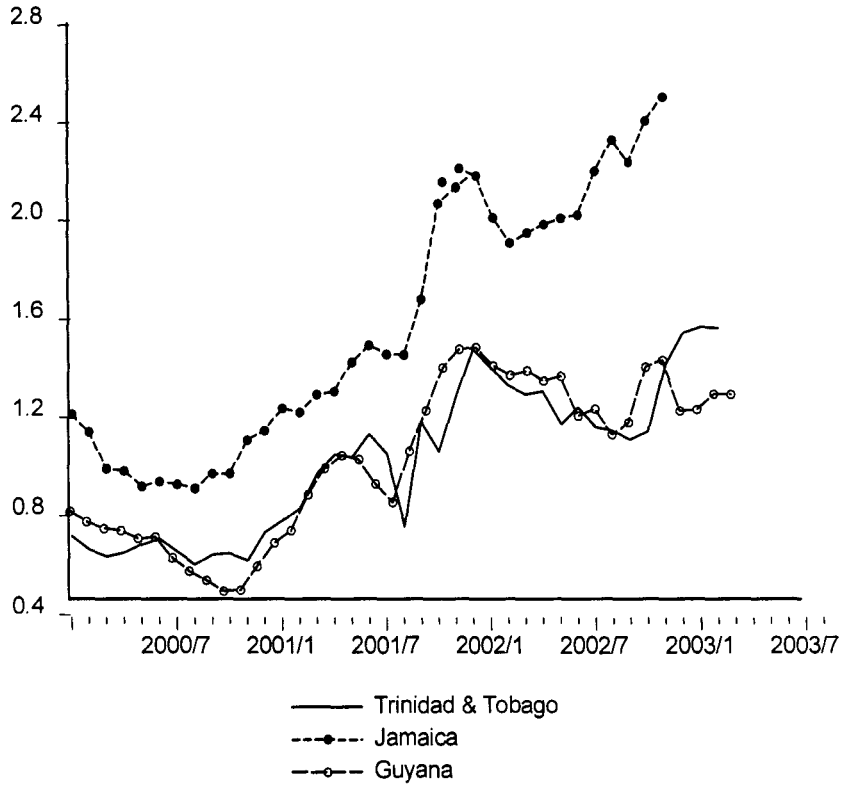


Table 3
Test of Equality of the Risk Premia: Means and Standard Deviations

	Guyana	Jamaica	Trinidad and Tobago	Anova F Statistic: All Three	Anova F Statistic: Guyana and Trinidad and Tobago	Brown-Forsythe (Modified Levene) test: All Three	Brown-Forsythe (Modified Levene) test: Guyana and Trinidad & Tobago
Mean	0.97	1.58	1.02	26.77***	0.50	10.69***	0.41
Std	0.33	0.52	0.31				

Notes: *** is significant at a 1 per cent level,
** is significant at a 5 per cent level, and
* is significant at a 10 percent level.

An attempt was also made to examine the association between the risk premia in all three markets, to see to what extent short-term investments in the markets would diversify risks. As a preliminary step, the correlations between the variables were inspected and turned out to be high (see Table 4). The risk premia variables were I(1) in all markets so cointegration tests were done. The variable was found to be cointegrated across countries, implying a long-run association between the returns obtained in the markets (see Table 5). The result suggests that buying Treasury bills across these three regional countries will not optimally diversify risks in the long-run for investors.

Table 4
Correlation between Risk Premia of Countries

	ρ_{Guyana}	$\rho_{Jamaica}$	$\rho_{T\&T}$
ρ_{Guyana}	1	0.92	0.96
$\rho_{Jamaica}$		1	0.92
$\rho_{T\&T}$			1

Table 5
Cointegration Tests: Risk Premia

	Eigenvalue	Trace Statistic	Max-Eigen Statistic
r=0	0.55	34.85***	26.36***
r<1	0.17	8.48	6.09

Notes: *** is significant at a 1 per cent level,
** is significant at a 5 per cent level, and
* is significant at a 10 per cent level.

The wider economic issue, however, is whether the movements in the rates are driven by common factors, given that a long-run association was found. The association between the risk premia with stability, demand and supply factors and transactions costs is presented in Table 6. The correlations vary significantly between the countries according to the variables considered.

Table 6
Correlation Between Monetary Conditions and Risk Premia

Monetary Conditions	Guyana	Jamaica	Trinidad and Tobago
Exchange Rate Volatility	0.0227	0.43	0.29
Interest Rate Volatility	0.35415	0.31	0.12
Excess Liquidity	0.65886	0.39	-0.01
Transactions Costs	-0.43798	0.02	0.61

Impulse analysis was used to examine the dynamic interactions between risk premia and the variables of interest. Incremental movements in the response of risk premia to shocks are displayed in Figures 2-4, while the cumulative impact is shown in Table 7. The diagrams suggest that most of the shocks last at least a year in their effect on the risk premia. An examination of Table 7 suggests that there are certain commonalities in the factors influencing the movement in risk premia. Shocks on the risk premium are the most important factor impacting on the variation in the risk premia, and the effects are procyclical. This indicates that past information on movements in the risk premia is the most important variable affecting the future level of risk premia. Secondly, exchange rate volatility generally has a positive impact on the risk premia in each country. This implies that the more volatile the exchange rate is, the more likely that the risk premia would expand, no doubt because of interest rate increases to buffer the exchange rate risk.

Figure 2

Guyana: Generalised Impulse Response Functions

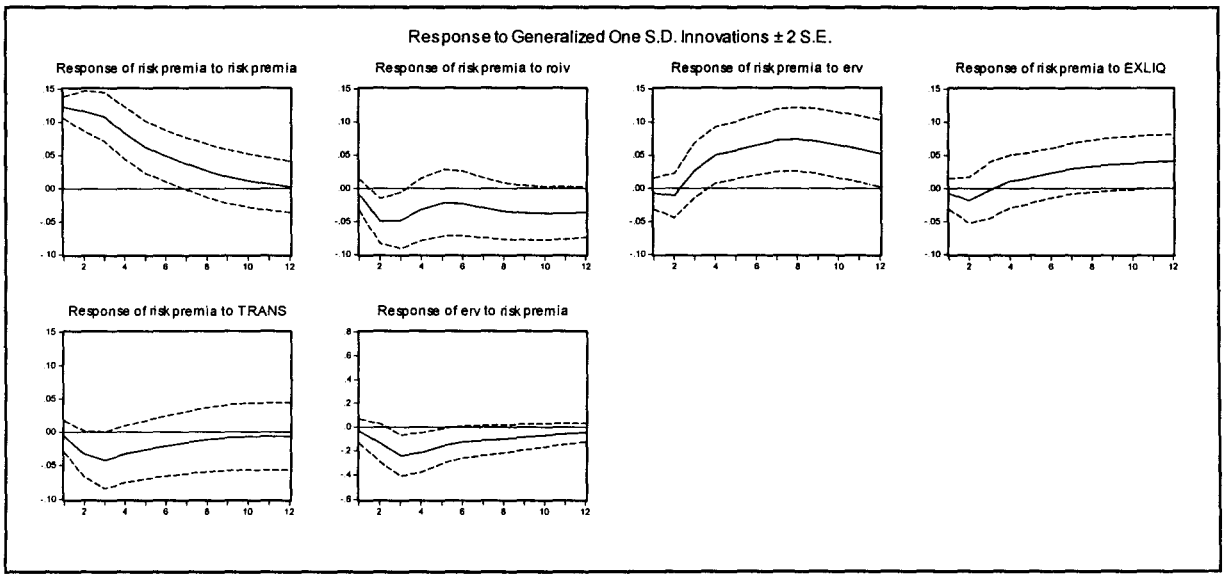


Figure 3

Jamaica: Generalised Impulse Response Functions

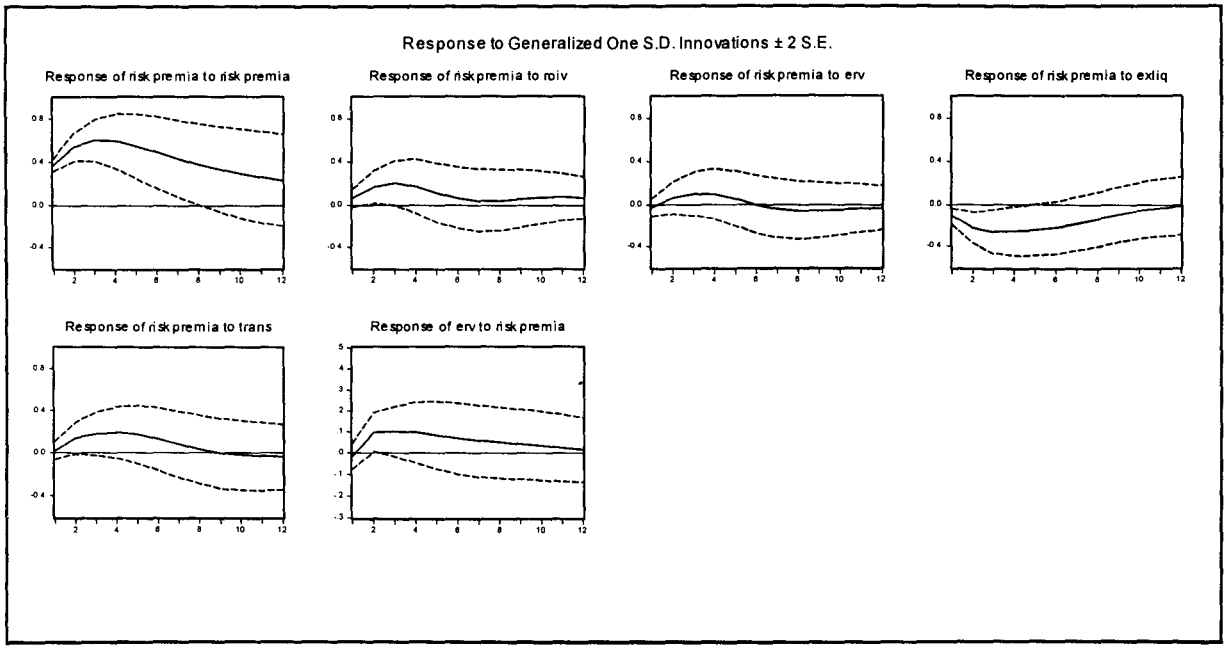


Figure 4

Trinidad and Tobago: Generalised Impulse Response Functions

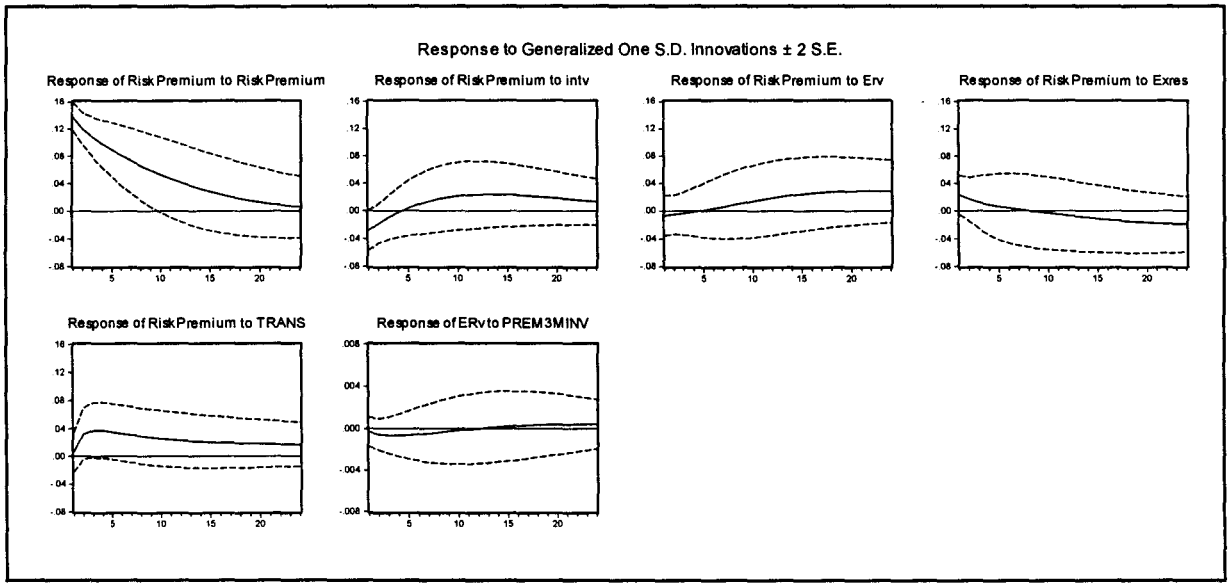


Table 7
The Cumulative Impact of Shocks on the Risk Premium

Period	Country	Risk Premium	Interest Volatility	Exchange Rate Volatility	Liquidity	Transactions Costs
3	Guyana	0.35	-0.11	0.01	-0.03	-0.08
	Jamaica	1.21	0.30	0.29	-0.33	0.23
	Trinidad and Tobago	0.63	-0.05	-0.01	0.07	0.18
6	Guyana	0.54	-0.18	0.18	0.02	-0.16
	Jamaica	2.24	0.43	0.62	-0.62	0.59
	Trinidad and Tobago	0.97	0.07	0.06	0.06	0.34
12	Guyana	0.65	-0.39	0.58	0.24	-0.22
	Jamaica	3.90	0.45	1.00	-1.12	1.10
	Trinidad and Tobago	1.19	0.30	0.38	-0.13	0.57

The countries differ, however, in terms of the order of importance of stability, liquidity and transactions cost variables. In Guyana, the volatility of the exchange rate is the second most important factor influencing the risk premia at the maturity of the treasury bill instrument and at the end of 12 months. Interest rate volatility is the second most critical variable impacting on the risk premia, but its effect is countercyclical. This may stem from the downward trend that the interest rate exhibited over the period.

In Jamaica, liquidity has the largest impact, after shocks in the risk premia on itself. The effect is countercylical, suggesting that there is a liquidity influence on interest rates, that is, a positive shock in liquidity dampens the magnitude of the risk premia. Exchange rate stability plays the second largest role in the third and 6th month, but it is overtaken by transactions costs in the 12th month.

With respect to Trinidad and Tobago, transactions costs consistently played the second largest role in generating expansions in the risk premia. Indeed, an examination of the incremental changes suggests that shocks in transactions costs led to higher increases in risk premia and died away slowly.

Conclusion

In spite of capital market liberalisation, the results do not support the existence of uncovered interest rate parity between the three Caribbean territories and the US market, with respect to money market rates. Accordingly, there is scope for diversfying risks between the US market and CARICOM regional markets.

Notwithstanding the non-linearity between the US and the Caribbean markets, the risk premia associated with investments in the regional money markets are showing early signs of moving together along a common long-run path. This fact would limit the degree to which investors can diversify risks across all three markets. However, it is questionable as to how long a similar trend would continue, since the trend in each market appears to be driven by different factors. This implies that although there are broad similarities across these markets, there are important differences in structure and functioning that cannot be ignored in investment decision-making. Nevertheless, the results show that there are significant arbitrage opportunities for investors emanating from Guyana and Trinidad and Tobago with respect to investing in the money market in Jamaica, given the higher returns available in that market after taking exchange rate movements into account.

References

Bleaney, M. and D. Laxton. 2003. "Real Interest Rates and Real Exchange Rates: Evidence from Indexed Bonds" *The Manchester School*, 71(1), 65-77.

Boulos, N. and E. Swanson. 1994. "Interest Rate Parity in Times of Turbulence: The Issue Revisited." *Journal of Financial and Strategic Decision*, 7(2), 43-52.

Davidson, J. 1985. "Econometric Modelling of the Sterling Effective Exchange Rate." *Review of Economic Studies*, 211, 231-240.

Dickey, D. and W. Fuller. 1981. "Likelihood Ratio Statistics for Autoregressive Time Series With a Unit Root." *Econometrica*, 50, 1057-1072.

Dominguez, K. and J. Frankel. 1993. "Does Foreign Exchange Intervention Matter? The Portfolio Effect." *American Economic Review*, 85(5), 1356-1369.

Flood, R. and R. Hodrick. 1990. "On Testing for Speculative Bubbles." *Journal of Economic Per-spectives*, 4, 85-101.

Flood, R. P. and P. M. Garber. 1984. "Collapsing Exchange Rate Regimes: Some Linear Examples." *Journal of International Economics*, 17, 1-13.

Flood, R. P. and A. K. Rose. 2001. "Uncovered Interest Parity in Crisis: The Interest Rate Defense in the 1990s." *IMF Working Papers*, No. 207.

Frankel, J. A. 1979. "On the Mark: A Theory of Floating Exchange Rates Based on Real Interest Rate Differentials." *American Economic Review*, 69, 610-622.

Frankel, J. and M. Chinn. 1993. "Exchange Rate Expectations and the Risk Premium: Tests for a Cross-Section of 17 Currencies." *Review of International Economics*, (2), 136-144.

Froot, K. and J. Frankel. 1989. "Forward Discount Bias: Is it an Exchange Rate Risk Premium?" *Quarterly Journal of Economics*, 104, 139-161.

Hodrick, R. 1987. "The Empirical Evidence on the Efficiency of Forward and Futures Foreign Exchange Markets." *Harwood Academic Publishers*, Chur, Switzerland.

King, A. 1998. "Uncovered Interest Parity: New Zealand's Post-Deregulation Experience", *Applied Financial Economics*, 8, 495-503.

Krasker, W. 1980. "The Peso Problem in Testing the Efficiency of the Forward Exchange Markets." *Journal of Monetary Economics*, 6, 269-276.

Lewis, K. 1988. "The Persistence of the Peso Problem when Policy is Noisy." *Journal of International Money and Finance*, 7, 5-21.

Lewis, K. 1989. "Changing Beliefs and Systematic Rational Forecast Errors with Evidence from Foreign Exchange." *American Economic Review*, 79, 621-636.

Loopesco, B. E. 1984. "Relationships Among Exchange Rates, Interventions and Interest Rates: An Empirical Investigation." *Journal of International Money and Finance*, 3, 257-278.

MacDonald, R. and M.P. Taylor. 1992. "Exchange Rate Economics: A Survey." *MF Staff Papers*, 39, 1-57.

McCullum, B. 1994. "A Reconsideration of the Un-covered Interest Parity Relationship." *Journal of Monetary Economics*, 33, 105-132.

Meredith, G. and M.D. Chinn. 1998. "Long-Horizon Un-covered Interest Parity." *NBER Working Paper*, No. 6797.

Moosa, I. and R.H. Bhatti. 1996. "Does Europe Have an Integrated Capital Market? Evidence from Real Interest Parity Tests." *Applied Economic Letters*, 3, 517-520.

Mussa, M. 1990. "Exchange Rates in Theory and Reality." *Essays in International Finance*, 179, Princeton: International Finance Section, Department of Economics, Princeton University.

Obstfeld, M. and K. Rogoff . 1986. "Ruling Out Divergent Speculative Bubbles." *Journal of Monetary Economics*, 17, 349-362.

Phillips, P.C.B. and P. Perron. 1988. "Testing for a Unit Root in Time Series Regression." Biometrica, 75, 335-346.

Taylor, M. 1995. "The Economics of Exchange Rates." *Journal of Economic Literature*, 33, 13-47.

Williamson, J. 1983. *The Open Economy and the World Economy*, Basic Books, New York.

Wu, J. and S. Fountas. 2000. "Real Interest Rate Parity Under Regime Shifts and Implications for Monetary Policy." *The Manchester School*, 68(6), 685-700.

Section F:
Rmerging Trade Issues

21

Trade and Development Issues Regarding Services in Caricom

Ramesh Chaitoo

Abstract

Despite the significant contribution of services activity in overall economic activity within the Caribbean Community (CARICOM), little specific attention, other than to tourism, has been paid to fostering its continued development. More investment in new service activities is needed, as well as stronger support and promotional efforts by regional governments. In addition, the fostering of a vibrant services economy must be underpinned by a marriage of trade and industrial policies. More importantly, a closer link is required between the ongoing process to create a viable regional single market arrangement and the ability to attract foreign investment to better position regional economies to capitalise on expected opportunities in the global economy.

Introduction

Services output comprises a significant proportion of economic activity within the Caribbean Community (CARICOM).[1] This is particularly true of the smaller territories in the Organisation of Eastern Caribbean States (OECS) where services account for an average of 85 percent of GDP and 73 percent of exports. Despite the importance of the services sector in a number of Caribbean economies, very little empirical work has been undertaken on the sector's contribution to growth, employment and foreign exchange receipts, as well as on how government policy could contribute to the further development of the sector. Indeed, the historical approach to government policymaking has been

1 Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago. Haiti recently joined CARICOM, but has not yet fulfilled all of its obligations under the CARICOM Treaty. The Bahamas is a member of CARICOM, but not of the Common Market.

to focus on trade in goods and inadvertently ignore services, perhaps because the stakeholders in the manufacturing and agricultural sectors are much more organised and have traditionally enjoyed direct access to the government. Also, data limitations limit in-depth analysis of the various activities in the "invisibles" sector.[2] As a result, little specific attention has been paid to fostering the development of services industries in CARICOM, except for the tourism sector. Furthermore, CARICOM states have not included rules or market access provisions regarding services in bilateral trade agreements. This is true even in the most recent agreement – the Free Trade Agreement (FTA) signed with Costa Rica in 2003.[3]

Most CARICOM countries face declining external competitiveness and an erosion of trade preferences in key markets for mainly agricultural export commodities. Indeed, as Canada, the European Union and the United States sign bilateral trade agreements with a host of different countries, the preferences which CARICOM states now enjoy in those markets will become less meaningful. In particular, with regard to the United States, the non-reciprocal duty-free access for goods under the Caribbean Basin Initiative is expected to end when the Free Trade Area of the Americas (FTAA) comes into effect. Furthermore, it is possible that CARICOM's non-reciprocal preferential treatment in the European market may terminate when a Regional Economic Partnership Agreement with the European Union is completed in 2007.

Although the tourism and "offshore" financial services sectors are well developed in many CARICOM economies, foreign investment in other service sectors has not grown significantly in the last decade. At the same time, most domestic service firms are small and lack the capital base to develop into exporters. Also, CARICOM governments have apparently not focused on promoting the services sector through their industrial and trade policies. In the same way that trade negotiations reduce barriers and create economic opportunities in overseas markets for CARICOM goods, efforts should be made to do the same for services.[4] Simultaneously, CARICOM states must reduce the regulatory and other impediments to investment in services. The traditional reluctance to negotiate market access in services must change. There is need to focus on new service activities and aggressively pursue the development and export of services in those areas in order to diversify the services base in most CARICOM states.

---

2 Economists have traditionally considered most services to be non-tradable because services are usually consumed where they are produced. However, technological changes and trade liberalisation have led to phenomenal growth in trade in services.

3 CARICOM has concluded trade agreements with the following countries: Venezuela (1992); Colombia (1994); Dominican Republic (2000); Cuba (2001) and Costa Rica (2003).

4 Interestingly, in the CARICOM-Cuba Agreement, both parties are supposed to initiate negotiations on the establishment of a regime dealing with bilateral trade in services as soon as possible after completion of the intra-CARICOM services regime under the CARICOM Single Market and Economy (CSME). However, since 1998, the FTA with the Dominican Republic looks to new negotiations on services which have not yet materialised.

A recent report by the Commonwealth Secretariat indicates the relatively higher cost of doing business in small economies. As a result, small states will always need special treatment (Winter and Martins, 2003). While this may be true for manufacturing, in the case of services, scale economies are less important. Various researchers have pointed out that small services firms are successful exporters worldwide (Riddle, 2002; OECD, 2003). Nevertheless, the relatively high cost of inputs (such as telecommunications, energy, finance) faced by services firms in the CARICOM region does affect their competitiveness and their ability to export. While it may be difficult to reduce the cost of some inputs (due to the small scale of utilities, for example), and although attempts have been made to reduce the cost of telecommunications in the Caribbean by introducing competition in several countries, these costs and finance remain major impediments to the competitiveness and further expansion of services firms in CARICOM.

Services Contribution to Caricom Economies

Table 1 shows the contribution of services to GDP and to exports in CARICOM countries for the year 2000. The data clearly demonstrate the importance of services in most economies in the region.[5] Therefore, a clear case

Table 1
The Contribution Of The Services Sector In Caricom (2000)

CARICOM Member State	Services as % of GDP	Services as % of Exports
Antigua & Barbuda	92.9	91.4
Bahamas	n.a.	78.6
Barbados	84.1	79.6
Belize	62.4	44.8
Dominica	76.4	55.0
Grenada	83.9	72.1
Guyana	46.5	21.1
Haiti	61.8	37.6
Jamaica	71.1	56.6
St. Kitts & Nevis	84.2	68.2
St. Lucia	87.1	81.9
St. Vincent and the Grenadines	83.3	66.9
Suriname	61.5	18.6
Trinidad & Tobago	67.9	12.5

Source: ECLAC, International Monetary Fund and Eastern Caribbean Central Bank.

Note: n.a. indicates data not available.

5 The situation is different in the buoyant manufacturing economy of Trinidad and Tobago which has significant natural resources. In the case of Guyana and Suriname, the services sectors are relatively under-developed, as reflected by both the low contribution to GDP and particularly to exports in the case of Guyana and to exports in Suriname.

could be made for reorientation of the focus of industrial and trade policy on the services sector in the region.

While services constitute a significant part of CARICOM economies, services exports for most CARICOM states are now concentrated in tourism and financial services. As ECLAC (2003, p. 8) pointed out:

> An examination of services exports from the Caribbean reveals high dependence on tourism (travel receipts). For example, travel accounted for nearly 90 percent of the service receipts of the Dominican Republic and The Bahamas and 67 percent of those of Jamaica and Barbados in 2000.

Another important consideration is the inability of the services trade surplus in CARICOM to compensate for the significant merchandise trade deficit of the region, which has been steadily increasing in recent years. Table 2 shows the aggregate trade balance for the countries of the OECS grouping[6] for the period 1996-2002. What is evident at first glance is that the net services surplus is insufficient to offset the growing merchandise trade deficit. This should be of some concern since the OECS economies are predominantly service-oriented.[7] Furthermore, Table 3 displays a similar picture for the CARICOM region[8] as a whole. While the services trade balance was more or less constant over 1996-2002, the merchandise trade deficit increased by 32 percent.

Table 2
Comparison of Services and Goods Trade Balances in the OECS Sub-Region
(US$ millions)

	1996	1997	1998	1999	2000	2001	2002
Goods Balance	-869.10	-965.47	-1,000.99	-1,076.34	-1,096.61	-1,025.51	-1,034.98
Services Balance	536.68	586.97	639.23	668.78	704.03	672.76	638.37
Overall Trade Balance	-332.42	-378.50	-361.76	-407.56	-392.58	-352.75	-396.61

Source: Caricom Secretariat (2003).

6 Antigua and Barbuda,Dominica, Grenada, Montserrat, St Lucia, St Kitts and Nevis, St Vincent and the Grenadines.

7 The Eastern Caribbean Central Bank indicated that the deficit in the current account is balanced by inflows of foreign direct investment, loans and development assistance grants.

8 Data include Barbados, Guyana, Jamaica, Suriname, Trinidad and Tobago (MDCs) and Belize, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines (LDCs).

Table 3
Comparison of Services and Goods Trade Balances for Caricom
(US$ millions)

	Balance of Trade in Goods						
	1996	**1997**	**1998**	**1999[a]**	**2000[a]**	**2001[a]**	**2002[b]**
CARICOM	-2,725	-4,148	-4,403	-3,809	-3,003	-3,442	-3,612
MDCs	-1,688	-3,000	-3,253	-2,471	-1,887	-2,387	-2,550
LDCs	-1,037	-1,147	-1,150	-1,338	-1,115 a	-1,056 a	-1,062
Balance of Trade in Services							
CARICOM[c]	1,801.5	1,883.1	2,083.1	2,067.8	1,933.9	1,801.7	1,717.6
MDCs [c]	1,247.5	1,286.3	1,449.9	1,409.7	1,284.6	1,134.9	1,082.1
LDCs	554.1	596.9	633.3	658.1	649.4	666.8.	635.5
Net Trade Balance							
CARICOM	-923.5	-2,264.9	-2,319.9	-1,741.2	-1,069.1	-1,640.3	-1,894.4

Source: CARICOM Secretariat (2003).

Notes: a Excludes Antigua and Barbuda due to lack of data;
b Data for Guyana, and Suriname taken from preliminary BOP figures;
c Excludes Suriname for the entire period due to lack of data.

Constraints to the Development of Services Industries in CARICOM

Inadequate information on service industries and trade

The lack of adequate information on service industries in CARICOM may be a major constraint to the development of appropriate policies to stimulate growth and exports. In fact, trade in services is poorly understood due to the lack of reliable data on individual services categories. Only Belize uses the Extended Balance of Payments Classification of Services (EBOPS), which provides the greatest sectoral detail for services receipts and payments. The other CARICOM states utilise the classification of International transactions in Services in the 5th edition of the International Monetary Fund, Balance of Payments manual – the so called BPM 5 system - which is limited to a few service sectors. Therefore, all countries should adopt the EBOPS regime and collect data through other means as well. This will provide a better indication of the composition of services in the overall trade of the region.

In addition to the data constraints, services firms are not well represented in the Chambers of Commerce in the region, and their diverse nature and small size make it difficult to have unified representation to governments to seek policy initiatives to benefit the sector. A useful proposal emerged some years ago

regarding the creation of national coalitions of service industries in each CARICOM state along with a Caribbean Coalition of Service Industries. Although this initiative was endorsed by CARICOM Ministers of Trade, there has been limited success in creating such representative bodies. The only national services entity to be established to date is the Barbados Coalition of Service Industries (BCSI) which was established with support from the Government of Barbados in November 2002. There seems to be little enthusiasm among service firms to form national service organisations for negotiations or other initiatives in other countries.[9]

Attitudes Towards Trade Liberalisation and Foreign Investment in Services

Given the small size of CARICOM economies, policy makers have been hesitant to relinquish control over their service sectors. There is a political economy argument about the risk of "crowding-out" by foreigners if service industries are liberalised too quickly. In the interim, it is necessary for developing countries (including CARICOM) to develop domestic service industries first. Another plausible reason for caution has been concern over the under-developed regulatory regime in many service sectors. Some governments maintain a position not to liberalise any service activity until appropriate regulations are implemented. This has been the general position of almost all developing countries in the WTO negotiations as well. As a result, CARICOM, as a group, and individual governments have been conservative in services negotiations in the WTO and other forums. However, this may not be the best approach, given the inadequate new investment in service industries in the Caribbean, apart from tourism and financial services. Furthermore, the regulatory deficit may be overstated and the choice between liberalisation and development of services regulations can be a "chicken and egg" dilemma. In light of the capacity constraints in almost all developing countries, if one waits until sectoral regulations are propounded before opening a service sector, then the sector itself may never develop, given the lack of resources for domestic investment. Some pragmatism may be needed. As was demonstrated in the case of electronic commerce, it is sometimes necessary to allow new industries or economic activities to excel before seeking to regulate them.

Another reason for the conservative approach by CARICOM countries to services negotiations at the international level is the movement towards the CARICOM Single Market and Economy (CSME). The liberalisation of trade in services among member states of CARICOM is codified in Chapter III of the Revised Treaty of Chaguaramas. In February 2002, the proposals for the removal of restrictions to trade in services and the movement of capital were finally elaborated and presented to the Heads of Government. It identified the sectors in which restrictions exist and when they will be removed.[10] According to the

---

9 However, at the sectoral level there are various services associations, particularly in professional and financial services – accounting, engineering, insurance, banking, etc. But these associations do not deal with trade negotiation issues.

10 About 340 restrictions affecting trade in services, the movement of persons and capital in CARICOM have to be removed.

proposal, trade in services through the four modes of supply would in principle be totally liberalised by the end of 2005. The legal and administrative tasks involved in this process and the political determination needed are enormous, and it appears that the deadline may not be met. In the meantime, one must be careful not to lose opportunities in the international economy if the CARICOM single market process is protracted.

An Organisation for European Co-operation and Development (OECD) study on concrete examples of services exports by developing countries highlights the importance of linkages between companies in developing export capacity, in particular, partnerships with companies from developed countries and also with companies in other developing countries. Furthermore, the research indicates that few services exporters are single entrepreneurs.[11] This suggests that it is important for small countries (as in CARICOM) to provide the conditions for foreign firms to invest in their services markets, as well as seek the reduction of regulatory barriers in the larger economies in which small firms from developing countries have an interest.

The Characteristics of Service Firms in CARICOM

For the most part, indigenous service firms in CARICOM are small by international standards,[12] resulting in significant challenges in terms of exports.[13] Small service suppliers typically have limited human resources to build referral networks, find local partners, identify market opportunities and research regulations overseas. As Riddle (2002) points out, "Experience shows that human resources are the primary constraint, across all sectors and markets, as it is staff that actually create and deliver any service."

The mainly small service firms in CARICOM also have market development constraints because of low brand name recognition outside the domestic market. This makes it difficult for firms to compete with larger, well-known international service companies. As a result, regional services firms cannot market their services based simply on reputation. They have to find other means of demonstrating their capabilities to potential clients overseas like through business trips to the target markets. It is, therefore, not surprising that temporary entry or presence of natural persons is the mode of supply in which CARICOM firms are the most competitive. They are generally too small to invest overseas or establish a commercial presence.

---

11 OECD. "Services Trade Liberalisation: Identifying Opportunities and Gains." Report presented to the WTO Council for Trade in Services Special Session, July 10, 2003.

12 Interestingly, the United States submitted a proposal at the WTO in 2002, in which small service suppliers were defined as firms with up to 100 employees, total assets of up to US$3 million and total sales of up to US$3 million. This definition characterises a large firm in most CARICOM states.

13 Across CARICOM a small firm may be considered to have capital of less than US$200,000, as defined by national legislation, usually Small Business Acts.

The third major constraint to services firms is the lack of finance, since most firms have to rely mainly on internal working capital for export market development, which creates an often insurmountable limit for small service suppliers with limited financial resources. As Riddle (2002, p. 2) pointed out:

> Small service suppliers wishing to access external funds (e.g., bank financing) report having to invest considerable time to educate account managers regarding their businesses and their credit worthiness (Bruce, 2001; Riddle, 2000e). For contractors, access to funding to post performance bonds may also be difficult. In most CARICOM countries, the usual financing mechanism for service suppliers of an overdraft secured by accounts receivable is not available.

The Role of Infrastructural Services

It is common knowledge that telecommunications and financial services are critical infrastructural services to manufacturing, as well as many other service industries. In the Caribbean, neither of these services is now appropriately priced to foster the development of competitive exports from small service suppliers or from new service industries.

The Attitudes of Financial Institutions

The cost of capital varies from 22 percent in Suriname to about 10 percent in Trinidad and Tobago; even so, the mainly small services firms in CARICOM economies have difficulty in securing loans for investment. While there is no published data to demonstrate this, the anecdotal evidence clearly indicates that banks in the CARICOM region are less willing to provide loans to services firms than to manufacturers. This is particularly acute in the case of new sunrise services activities, such as information and communication technologies (ICT) and potentially lucrative areas like entertainment and music. Perhaps this is the most glaring constraint to the development of new service industries in the Caribbean.

The reasons are partly due to the small size of services firms and the perception of greater risk by financial institutions. There is clearly a deep-seated tendency to be over-conservative and not lend to firms that do not have physical assets (perhaps that can be appropriated in the case of loan default). In fact, commentators in the business community and in academic circles have argued that banks in CARICOM seem hesitant, unwilling or unable to value intellectual assets and hence avoid loans to services firms that typically do not have extensive physical assets. On the other hand, banks seem to be much more enthusiastic about providing consumption loans to private citizens.[14] This problem must be

---

14 Caribbean banks prefer to focus on consumption loans, which have higher returns and lower risk. See Henry (2003).

addressed and mechanisms for the provision of capital to small services firms should be put in place in order to foster the development of service companies which may eventually become exporters.

It may be worthwhile for governments and chambers of commerce to explore the possibility of creating special incubator-type facilities for small service firms and provide soft loans to facilitate the development of services exporters.

The Cost and Availability of Telecommunication Services

In spite of the much-touted liberalisation of telecommunications across the Caribbean, the real liberalisation in the CARICOM region has been timid so far and is largely limited to cellular or mobile services, and in some instances to only domestic cellular services. This may go a long way in reducing the cost of telephone charges to consumers, but will do little to stimulate the growth of commercial valued-added operations in telecommunications and a host of services that are commonly referred to as ICT. Policymakers must be cognisant of this and truly see low cost telecommunications as a requirement for facilitating the growth of other service industries, and act to liberalise all areas of telecommunication services. There may be need for binding commitments in value-added telecoms services in CARICOM states.

While new technologies have made it possible to deliver a wide and increasing range of services electronically, the cost of telecoms in CARICOM States significantly limits such possibilities. For instance, during regular working hours, it is significantly cheaper to make a telephone call from North America to the Caribbean than vice-versa or even between Caribbean islands. More importantly, broad band or high speed Internet services are still prohibitive in terms of the cost to most small businesses. But the Internet provides opportunities for addressing some of the key limitations faced by small businesses by reducing transactions costs and giving them a global presence.

A related issue is the fact that although a single CARICOM market is being constructed, telecommunications was omitted from the programme for removal of barriers among CARICOM states. The economic logic for a single market in telecommunications services is clear. The political issues have to take second place and the telecommunications sector should be brought under the CSME programme.

Current Incentives for Service Firms in CARICOM

The need to increase investment in and exports from service industries in the Caribbean makes it timely for CARICOM states to revise their incentives regime and focus on services. Information on current incentives to promote the development of service industries in CARICOM is not readily available from national governments. However, recent Trade Policy Reviews conducted by the WTO shed some light on what is currently in place. In the case of tourism, it appears that most countries except Suriname have subsidies in the form of tax incentives for

new investments, and duty is waived on inputs for businesses in free zones.[15] But incentives are quite limited in other service sectors. Jamaica has the most comprehensive incentive programme for service industries, which covers areas such as tourism, maritime transport, banking,other financial services, software/ information technology, recreation, culture and sports, and audiovisual services. It has stimulated some significant investment and job creation in the ICT sector by a range of incentives as well as by negotiating special rates for telecommunications services supplied to ICT firms in the Montego Bay area.[16] The incentives in CARICOM states which are considered services subsidies are mainly tax incentives and duty free inputs or free zones. No CARICOM government gives direct grants.

While incentives are helpful and do affect investment decisions they may be more attractive to foreign investors, not domestic firms that are seeking to expand. The main constraint to getting small services firms in CARICOM to grow and export their services is the lack of finance.

Strategies to Develop and Export Services

In its report on *Prospects for Services Exports from the English-Speaking Caribbean* in 1996 the World Bank made the following recommendations which are still relevant:

> A public sector strategy to spur development of service exports should focus on enabling the private sector to achieve four objectives: developing capacity to produce service exports, increasing cost competitiveness, improving service exports quality, and building market linkages.... There is an inability to substantially expand service exports in many subsectors due to insufficient inputs. Development of a market-based training support mechanism to foster computer literacy and skills development, and liberalisation of work permit policies to ease current limitations in commercially-applicable expertise and management capacity would yield results in the near term. Reducing costs and delays in business entry and in obtaining work permits would significantly improve the environment for foreign investment. Elimination of limitations on foreign equity ownership and licensing requirements is needed.

Various commentators have suggested that the Caribbean region should be able to make significant inroads in the development of services exports to the United States in non-traditional sectors (that is, other than tourism and finance). In 1996, the World Bank suggested that greater attention should be paid to

---

15 Tourism incentives are the most common across WTO Members as well.

16 JAMPRO reported in 2003 that the ICT industry has some 96 companies and affiliates which are operating as: software distributors and dealers; System consultants, technical support and software developers; Internet Service providers/Web content; Computer training companies; Export Service Providers of Data Entry, Tele-marketing, CAD/CAM and customer software. Of these companies, 44% are export service providers originating mainly from North America.

information and communication technology (ICT), valued-added tele-communications, professional services, health services and entertainment services. There are also prospects for increased exports of ship repair and maintenance and maritime transport services.

Given its proximity to the United States and Canada, there is potential for export possibilities through outsourcing contracts from North American companies in a range of back-office business services such as accounting, payroll administration and processing of insurance claims, among others. While outsourcing is a very controversial issue in the United States at the moment,[17] it will remain an area of significant activity due to the economic realities of modern business arrangements. As production systems continue to become more flexible, with networks of production spread across various countries, CARICOM countries should actively position themselves and promote the capacity of Caribbean firms to provide valuable business and other services at competitive cost and in an efficient manner. The common English language tradition and similar time zones make the Caribbean a potentially attractive place for outsourced work. But this is not enough. The market for services exports is highly competitive and firms consider outsourcing when cost savings are in the vicinity of 30-40 percent. Therefore, it is critical that the inputs to service firms be competitive in CARICOM.

In any event, significant promotional efforts need to be put in place to facilitate and stimulate such outsourcing activities. But to date, little focused attention has been paid to this area either by government agencies or private sector organisations in CARICOM.

Successful Services Exporters in CARICOM

In many instances, small firms do not make the effort to export their services because of human resource and information constraints and the psychological and financial cost of overseas operations. In spite of the structural and other challenges to services firms in the CARICOM region, there are numerous firms that are successful exporters, albeit on a very limited scale. Unfortunately, one has to rely only on anecdotal evidence as information about such successes is not readily available.[18] Much needs to be done to promote the successful service firms as examples for other companies to emulate. For instance, in Barbados, one can cite two examples of indigenous firms in very different industries – Goddard Enterprises (Flightkitchen division) which caters to airlines in sixteen countries through partnerships; and Prism, a network or information technology

17 Recently, there was an attempt to introduce a bill in the Congress to penalise firms for outsourcing.

18 Even the services firms are not known in most countries. A recent initiative to conduct a survey of services firms across CARICOM may shed some light on the nature and type of firms and their areas of activity.

firm in Barbados with operations in five countries.[19] Prism's customers include Visa and Mastercard as well as various Caribbean banks and supermarkets. An example of a successful "foreign" firm is Indusa Global located in Montego Bay, Jamaica, which provides IT solutions to various business customers. Also, in 2003 Republic Bank of Trinidad and Tobago acquired Banco Mercantil in the Dominican Republic - and Guardian Life Insurance of Trinidad and Tobago recently extended its reach in the insurance industry and invested in the insurance market in Malta in 2003. The evidence indicates that it is quite possible for small firms to grow and become exporters and this model can be expanded across CARICOM.

It would be very worthwhile to mount a regional campaign in CARICOM to encourage small and medium services firms to think in terms of exporting. It does not seem that many of the national export promotion agencies in CARICOM countries actively court service companies. The traditional approach has been to support manufacturers, perhaps because their physical products can be easily demonstrated and sampled in displays, and trade fairs are very much a visual experience. But it is necessary to have a concerted national effort to promote services exports if governments are serious about promoting the development of service industries to facilitate growth and to increase employment.

Conclusion

It is clear that there are opportunities for CARICOM countries to increase trade in services. However, it is necessary to further develop service industries and to stimulate new services activities. This requires a marriage of industrial and trade policies in the region. Given the resource and capacity constraints of most service suppliers in CARICOM, it is also important for governments to play a facilitation role by actively promoting and supporting service firms. This will also address some of the information asymmetries faced by potential and actual service exporters. As well, structural impediments to the growth of service industries must be addressed. It is important to understand the linkages between trade and investment in services and the growth of the services sector and factor this into national trade policies. There is also need for close linkages between the regional process to create a single market in services and the need to attract foreign investment in order to take advantage of economic opportunities in the global economy.

---

19 Prism sets up and manages debit and credit card networks and customer loyalty programmes. It also provides strategic solutions for electronic banking.

References

CARICOM Secretariat. 2003. *CARICOM's Trade in Services 1990-2000.* Georgetown: Statistics Sub-Programme, CARICOM Secretariat.

Demas, Allison and Ralph Henry. 2001. "Entertainment Services with Special Reference to Music, Mas and the Film and Video Segments." Report prepared for the Caribbean Regional Negotiating Machinery, June.

ECLAC. 2003. *Economic Indicators of Latin America and the Caribbean.* Santiago de Chile: ECLAC Secretariat.

ECLAC. 2003. The Development of Services in the Caribbean, 17 January. (LC/CAR/G.717)

Henry, Lester. 2003. "Implications for CARICOM Countries of Negotiations on Financial Services in the FTAA and GATS." Paper prepared for the Caribbean Regional Negotiating Machinery, May.

OECD. 2003. "Services Trade Liberalisation: Identifying Opportunities and Gains." Report presented to the WTO Council for Trade in Services Special Session, July 10.

Riddle, Dorothy. 2002. "Issues Regarding Small Service Suppliers in the Context of the FTAA." Paper prepared for the Caribbean Regional Negotiating Machinery.

Riddle, Dorothy. 2002. "Services Export Capacity in Developing Countries." Paper presented at WTO Symposium on Assessment of Trade in Services, March 15.

Winters, Alan and Pedro Martins. 2003. Beautiful but Costly: An Analysis of Operating Cost of Doing Business in Small Economies. London: Commonwealth Secretariat.

WTO. 2002. *Trade Policy Review: Barbados, Report by the Secretariat (WT/TPR/S/101),* 10 June.

WTO. 2003. *Trade Policy Review: Guyana, Report by the Secretariat (WT/TPR/S/122),* October.

WTO. 2001. *Trade Policy Review: OECS-WTO Members, Report by the Secretariat. (WT/TPR/S/85),* 7 May.

World Bank. 1996. *Prospects for Services Exports from the English-Speaking Caribbean.* Report No. 15301 CRG.

22

Trade Liberalisation and the Jamaican Economy: Prospects and Effects of Tariff Adjustments

Suzette Hudson[1]

Abstract

This paper reviews the trends in international negotiations with a view to identifying the time frame within which tariffs are likely to be adjusted. It traces the evolution and extent of trade liberalisation in Jamaica and assesses the prospects for further liberalisation in the near to medium term. It also attempts to quantify the impact of tariff adjustments on the macro economy, with particular reference to trade. One of the main findings of the paper is that tariff rates in Jamaica have a significant impact on the macro-economy, through imports. This points to the need for caution in the further liberalisation of the trade regime.

Introduction

There is some consensus that the process of trade liberalisation, initiated in the aftermath of the Great Depression in the 1930s, is likely to culminate in the total elimination of tariffs among the major economies of the world and most likely among developing countries by the year 2020. More recently, the objectives of multilateral negotiations have been expanded beyond liberalisation of trade in goods, which was the main focus of the negotiations under the General Agreement on Tariffs and Trade (GATT), to include a broader range of issues. These multilateral negotiations are being overshadowed by increased regionalism, which has served to accelerate rather than retard the liberalisation process.

---

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

22

Trade Liberalisation and the Jamaican Economy: Prospects and Effects of Tariff Adjustments

Suzette Hudson[1]

Abstract

This paper reviews the trends in international negotiations with a view to identifying the time frame within which tariffs are likely to be adjusted. It traces the evolution and extent of trade liberalisation in Jamaica and assesses the prospects for further liberalisation in the near to medium term. It also attempts to quantify the impact of tariff adjustments on the macro economy, with particular reference to trade. One of the main findings of the paper is that tariff rates in Jamaica have a significant impact on the macro-economy, through imports. This points to the need for caution in the further liberalisation of the trade regime.

Introduction

There is some consensus that the process of trade liberalisation, initiated in the aftermath of the Great Depression in the 1930s, is likely to culminate in the total elimination of tariffs among the major economies of the world and most likely among developing countries by the year 2020. More recently, the objectives of multilateral negotiations have been expanded beyond liberalisation of trade in goods, which was the main focus of the negotiations under the General Agreement on Tariffs and Trade (GATT), to include a broader range of issues. These multilateral negotiations are being overshadowed by increased regionalism, which has served to accelerate rather than retard the liberalisation process.

---

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

Against this background, Jamaica and the rest of the Caribbean Community (CARICOM) have become involved in multilateral trade negotiations in several arenas, simultaneously, for perhaps the first time in history. In 2003, for example, Jamaica's negotiators have participated in discussions at the level of the World Trade Organisation (WTO), the Free Trade Area of the Americas (FTAA), the Caribbean Single Market and Economy (CSME), the African Caribbean Pacific/ European Union (ACP/EU) and other multilateral talks. The objective of these negotiations is to accelerate the pace of trade liberalisation, the impact of which has not been fully explored by developing countries.

The current negotiations are being conducted against the backdrop of a chronic current account problem in the balance of payments, as well as significant increases in the fiscal deficit. Hudson and Stennett (2003) noted that Jamaica's current account deficit is large and persistent, relative to a set of benchmark countries. This deficit deteriorated progressively to 14 percent of GDP in 2002 from 4.6 percent of GDP in 1997. Declines in non-traditional exports, particularly garments, in conjunction with rapid growth in consumer imports, fuelled the widening of the deficit. The trend deterioration was also underpinned by incipient fiscal deficits, as well as the re-emergence of private sector dissavings in 2000. At the institutional level, the accelerated pace of dissavings has been facilitated by the extensive and rapid trade liberalisation experienced by Jamaica since the launch of the economic stabilisation and reform programme in the mid-1980s.

In this context, the paper assesses the implications of tariff adjustments for the Jamaican economy, with particular reference to trade volumes and real GDP. The paper reviews the trends in international trade negotiations, with a view to identifying the time frame within which tariffs are likely to be adjusted. It also evaluates the degree to which the country has liberalised its trading regime and assesses the extent of further liberalisation that could be undertaken in the near to medium term. The available data on tariff rates, trade volumes and real domestic income, *inter-alia*, suggest that these tariff adjustments have had an appreciable impact on the economy, in particular on imports. The immediate implication of these findings is that further trade liberalisation should proceed cautiously until policies are formulated to address the current account deficit.

The paper is organised as follows: Section 2 discusses the evolution of multilateral negotiations since the advent of the GATT; Section 3 traces Jamaica's trade policy over time and highlights the commitments that have been made in multilateral, regional and bilateral agreements; Section 4 provides an overview of the trends in Jamaica's trade policy. An empirical assessment of the impact of tariff changes in Jamaica is discussed in Section 5. Section 6 concludes.

International Trade Negotiations: The "20/20" Vision

The system of multilateral trading rules administered under the GATT and subsequently the WTO forms the core of the globalisation process. The original 23 countries that established the GATT Agreement sought to create a system that would provide global discipline or rules relating to trade liberalisation in goods and services. These rules include: (1) the right to government protection of domestic industries through tariffs, while eliminating the use of quantitative

restrictions (except in a limited number of situations);[2] (2) the reduction of tariffs and their irreversibility; (3) the principle of most favoured nation treatment (MFN), requiring that tariffs and other regulations apply to goods from all countries without discrimination among countries;[3] and (4) the principle of national treatment, prohibiting countries from discriminating between imported products and domestically produced goods.[4]

The first six rounds of the GATT (1947-1967) were primarily focused on reducing or eliminating tariffs on industrial products (see Table A in the Appendix). The GATT has, therefore, precipitated a significant reduction in tariffs on industrial goods, from an average of approximately 40 percent in the 1940s, to an average of 5 percent in the 1990s.[5]

During the Uruguay Round (1986-1993), negotiations were broadened to include a number of issues that had never been discussed before in global trade negotiations. It was believed that many of these issues, though not directly classified as tariff or non-tariff barriers to trade, indirectly affected trade in goods and services and were generally considered as actual and/or potential barriers. The Uruguay Round, therefore, sought to address matters related to dumping, rules for the liberalisation of trade in services, the protection of intellectual property, rules allowing for the settlement of international trade disputes, the relationship between sanitary and trade regulations and textiles and apparel. A decision to eliminate quotas and other non-tariff measures in agriculture through a process of tariffication[6] was also addressed during the round. In an effort to further liberalise world trade, other trade issues were added to the agenda of the more recent ministerial conferences. These encompassed anti-dumping measures, subsidies, safeguards, investment

---

2 The rationale behind the allowance of tariffs and not quantitative restrictions is that tariffs allow the normal rules of competition to function because they apply equally to all imported goods. The application of a uniform tariff is assumed to be the least distortionary instrument for achieving the protection objective. Quantitative restrictions (QRs) on imports, on the other hand, distort the market in that they artificially change the balance between demand and supply. As an exception to this rule, the GATT allows a country to impose QRs temporarily when it faces balance of payments difficulties.

3 There are some exceptions to this rule. Trade among members of regional trading arrangements which are subject to preferential or duty-free rates is one such exception. Another is provided by the Generalised System of Preferences, whereby developed countries apply preferential or duty-free rates to imports from developing countries, but apply most-favoured nation treatment rates to imports from other countries.

4 In this regard, it is not permissible for a country, after a product has entered its market on payment of a customs duty, to levy an internal tax at rates higher than those payable on a product of national or domestic origin.

5 Trading into the Future, WTO, p. 9.

6 The conversion of quantitative measures to tariff rates.

measures, trade facilitation, electronic commerce, competition policy, fisheries, transparency in government procurement, technical assistance, capacity-building, intellectual property protection and services and other development issues.[7]

Towards the latter half of the 1990s and into the 21st century, the focus has shifted from reducing tariffs on industrial goods to a reduction in tariff rates on agricultural commodities.[8] The focus on trade in agricultural commodities was initiated during the Uruguay Round of trade talks when the WTO's Agriculture Agreement was signed. This Agreement included specific commitments by WTO member states to improve market access and reduce trade-distorting subsidies in agriculture. The period for implementation of the commitments was six years for developed countries and ten years for developing countries, beginning in 1995 (see Table B in the Appendix).

The signatories to the Agriculture Agreement decided to initiate negotiations for continuing the reform process one year before the end of the implementation period, that is, by the end of 1999. These talks were incorporated into the broader negotiating agenda, which was set at the 2001 Ministerial Conference in Doha, Qatar. At this Conference, agriculture negotiations became part of the single undertaking in which virtually all the related negotiations were to end by 1 January 2005. The Doha Declaration envisaged that countries would submit comprehensive draft commitments, based on the "modalities",[9] by the Fifth Ministerial Conference in September 2003 in Cancún, Mexico. This deadline was missed. The final deadline for completing the negotiations is 1 January 2005.

During the past decade, the number of bilateral and regional trade arrangements (RTAs) has increased significantly.[10] A total of 176 regional trading arrangements was recorded by the WTO (as at December 2002), compared with 53 in 1990.[11] Another 83 arrangements have been notified to the WTO. More than 43 percent of the world's merchandise trade currently occurs under preferential trade arrangements. There has also been a rise

---

7 WTO, Annual Report, 2002.

8 Agricultural commodities comprised 9.1 percent of world merchandise exports and 40.9 percent of primary commodity exports in 2001.

9 This includes the numerical targets and formulas to be used by countries in the tariff reduction process.

10 A regional trade area is broadly defined as a group of countries that adopt zero or significantly low tariffs and no other restrictions on trade among themselves, while not necessarily changing the barriers that each member country has on trade with the countries outside the group.

11 WTO Trade Report, 2003, p. 46.

in cross-regional trading arrangements[12] and the involvement of countries that have traditionally remained outside regional trading systems. For example, the European Free Trade Association (EFTA) has signed an RTA with Mexico and several African states and is negotiating RTAs with Canada and Chile, while China has consented to join the Association of South East Asian Nations (ASEAN).[13]

Despite the significant reductions in tariff rates on a multilateral level, trade liberalisation has, therefore, occurred at a more significant rate among bilateral trading partners. For example, while the average applied tariff rate for trade within CARICOM is zero percent (except for items on the excluded list), the average rate applied to imports from third party states is approximately 12.0 percent. Both the rates applied among member states of CARICOM and the rate applied to third party states lie below the average WTO bound rates[14] of the regional trading partners. Similarly, for the members of the North American Free Trade Area (NAFTA), the tariff rate applied to imports from non-NAFTA sources is approximately 6.4 percentage points above the rate applied for NAFTA member states (see Table C in the Appendix).

Several factors were responsible for the acceleration in trade liberalisation between 1930 and the present. For the developed countries, the move towards free trade emerged in the aftermath of the Great Depression, when governments sought to increase economic output through a rise in international trade, primarily in goods. For developing countries, the move towards free trade was instigated by the onset of the debt crisis of the 1980s, which precipitated a sharp reduction in private external finance. Consequently, several countries adopted outward-looking trade policies in an effort to increase foreign exchange earnings and promote economic growth. The trend towards an outward orientation was encouraged by the success of countries that embraced these policies, such as Singapore, Malaysia, Taiwan and South Korea. Moreover, the provision of assistance for developing countries, particularly from the multilaterals, was conditioned on the adoption of more liberal trade policies. Trade liberalisation was also propagated by transnational organisations.

Currently, it would appear that the major players in the multilateral trading system would like to see substantial, further liberalisation by 2020. In particular, the USA, Canada, the EU and regional organisations such as the Asia Pacific Economic Cooperation (APEC),[15] are likely to play a leading role in accelerating

---

12 The WTO notes that before 1995 there were approximately 7 cross-regional free trade arrangements. By 2002, this number had increased to 25.

13 In November 2001, the WTO approved China's accession to the ASEAN.

14 A bound rate is a commitment, under the GATT or WTO, by a country, not to raise the tariff on an item above a specified level.

15 APEC member countries include: Australia, Brunei, Darussalam, Canada, Chile, People's Republic of China (China), Hong Kong (China), Indonesia, Japan, Republic of Korea (South Korea), Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Republic of the Philippines, Russia, Singapore, Chinese Taipei (Taiwan), Thailand, the United States and Vietnam.

the process of liberalisation. During the Uruguay Round, these countries introduced the concept of the "zero-for-zero" agreements that stipulated reciprocal elimination of tariffs, export subsidies and taxes in a number of sectors by 2004. These included agreements on pharmaceuticals, medical instruments and pulp and paper.

Since the Doha trade round, the USA has put forward aggressive liberalisation proposals. The USA administration has noted that its objective is to establish a "zero-tariff world" and has proposed the liberalisation of trade in industrial and consumer goods, agriculture and services in its 2003 trade agenda. In this regard, it advocated the removal of all tariffs on manufactured goods by 2015, with significant reductions in agricultural export subsidies and a cap of 25 percent on agricultural tariffs. This would be accomplished in two phases. In the first phase, 2005-2010, non-agricultural tariffs under 5 percent would be eliminated. For all other duties, the USA proposed a "Tariff Equaliser" formula that would bring all remaining non-agricultural tariffs down to less than 8 percent, with the highest tariffs falling faster than the lower tariffs so as to establish parity. The second phase of the proposal would be executed between 2010 and 2015. All WTO members would make equal annual tariff reductions, until tariffs on goods were eliminated. For agricultural commodities, the USA proposed to harmonise tariffs and subsidies, while reducing them to lower levels, on a course towards elimination.

Should consensus not be attained at the multilateral level, the USA has accelerated the move towards zero tariffs on bilateral and regional fronts. The country has noted that it would commit to "zero-for-zero" initiatives with interested WTO member countries to eliminate non-agricultural tariffs on highly traded goods, for example, environmental technologies, aircraft and construction equipment. Consequently, the USA entered into 12 RTAs in 2002 (including NAFTA) and has embarked upon efforts to establish the FTAA by 2005. Importantly, the members of the proposed FTAA have agreed in principle to tariff reductions on applied rates rather than bound rates (Chaitoo, 2002).

Canada has also spearheaded several RTAs, while the EU, which in the past favoured preferential arrangements, primarily with its former colonies, has sought to reduce and eliminate these discriminations or extend these "discriminatory" privileges to other states. The EU has negotiated over 30 RTAs.

The Asia Pacific Economic Corporation[16] has also played a noteworthy role in accelerating the process towards free trade, through its proposal of what has been commonly termed the "2010/2020 Bogor Goals."[17] The action plan seeks to liberalise trade and investment in the region by 2010 for developed economies in the RTA and 2020 for developing country members. At the same time, a fast-track approach is being implemented for what are deemed "less contentious"

---

16 The 21 APEC Member Economies collectively account for more than half of the world's total Gross Domestic Product and over 47 percent of total world trade in 2001.

17 The second APEC Economic Leaders' Meeting was held in Bogor, Indonesia, on 15 November 1994. Leaders took this opportunity to exchange their views on where the economies of the region needed to go for the next 25 or more years.

areas including pharmaceuticals and lumber, among others. Participating APEC economies are now in the process of notifying WTO members of their desire to negotiate tariff reductions in these sectors. APEC Ministers have also agreed that the next step should be to invite economies beyond APEC to participate in the tariff liberalisation elements of the initiative. APEC member states have also declared their commitment to help shape future trade negotiations in the WTO.

Although many developing countries have voiced a desire to see a deceleration in the pace of trade liberalisation and an increased focus on development issues, their contribution to the process has also been constant and ongoing. Tariffs among developing countries have declined by approximately 65 percent between the decade of the 1980s and the 1990s. In addition, RTAs among developing countries account for about 30-40 percent of all RTAs currently in force, including those not notified to the WTO. Some developing countries have taken the process of liberalisation even further by seeking to establish customs unions and common markets. Where protection of industries or particular domestic sectors remains, political factors are among the primary impediments.

There has been a proliferation of inter-linked or overlapping agreements, and a number of these arrangements exist along with the WTO multilateral trading arrangement, with several countries being members of more than one RTA. Jamaica, as a member of the WTO, is presently negotiating or has committed to RTAs with several countries, including the Dominican Republic, Cuba and Costa Rica. It has been noted that the increasing number of RTAs may represent a threat to multilateral liberalisation, distorting trade flows or increasing discrimination towards third states. However, insofar as RTAs abide by the principles embedded in Article XXIV of the GATT and Article V of the GATS, requiring that trade restrictions within these arrangements occur without barriers being raised on trade with non-members, it would appear that the recent proliferation of RTAs could accelerate the pace of further trade liberalisation.

It is uncommon for developed and developing countries to increase protection beyond the "bound" tariff rates established by the WTO. This would constitute a breach of the GATT Agreement to which all member states subscribe, with the added risk of retaliatory action by other member states. Indeed, for countries that subscribe to GATT, there are few instances where increased border protection is permitted, although there are some counter-examples, notably the USA tariffs on steel and lamb, which is portrayed as a temporary measure. There have also been rare instances where increased border protection has been permitted under the GATT. New Zealand's imposition of an anti-dumping duty on whiteware[18] from South Korea is one example.

Another indication of the acceleration in the trend towards liberalisation is the noted change in attitude by countries towards membership in the WTO and an increased interest in the rules-based system that has emerged from the Uruguay Round. This is partly related to the pace at which the world economy is

---

18 Whiteware is a generic name for ceramic ware that has been glazed but has no decoration.

integrating through international trade and the flow of foreign direct investment (FDI). The significant and revolutionary changes in communication and transportation have enabled the small manufacturers to access markets in distant countries. In addition, an increased number of countries are adopting market-oriented policies that reduce the state's participation in production and international trade. Many countries pursue these policies as a means of attracting FDI and encouraging transnational corporations that are able to lower production costs by obtaining human or capital resources from different parts of the world.[19] This increasing dependence on foreign trade has made governments and business enterprises aware of the vital role that the multilateral trading system plays in safeguarding their trade interests. In this respect, the importance of shaping the rules that guide the system has become of vital importance to countries. The result has been a 43 percent rise in the membership of the WTO between 1993 and 2003, with several membership applications pending.

There are factors that could impede the progress of global trade talks. Paramount among these is the recent failure of the ministerial meeting of the WTO in September 2003[20] to reach a consensus. This has, in many ways, made the conclusion of the Doha trade round[21] increasingly difficult and uncertain. The factors contributing to the breakdown of multilateral negotiations in Cancún included the complexity of the trade agenda, the lack of transparency in administration under the WTO, and the disinclination by developing countries to adopt the "Singapore issues" as an item for negotiations.[22] There was also a general dissatisfaction among a new coalition of developing countries grouping, the G-22, led by Brazil and India, over American and European farm reforms.[23] Negotiation of the FTAA, which requires a convergence of American and Brazilian

---

19 The United Nations notes that in 2001 there were over 60,000 transnational corporations with over 800,000 affiliates around the world.

20 The September 2003 ministerial meeting of the WTO was held in Cancún, Mexico.

21 The Doha trade round commenced in November 2001 with a ministerial in Doha, Qatar (see Table A in the Appendix for details on some of the issues to be covered by the round) and is to be concluded in 2005.

22 The Singapore issues first emerged in 1996 at the WTO Ministerial Conference in Singapore. Member states agreed to explore the relationship between trade and investment, trade and competition policy and examine transparency in government procurement and trade facilitation. The broad objectives behind this initiative were to ensure greater access by foreign nationals to investment opportunities in host countries, foster the interplay of market forces through the standardization of competition rules, allow greater transparency in the channelling of government investments, and ensuring the establishment of institutions that facilitate enhanced free trade.

23 The farm policies include the US Farm Bill (2002) and the European Common Agricultural Policy (CAP) of 2003.

positions, is linked substantively to the Doha trade round[24] and as such the FTAA negotiations could be set back. The failure of the WTO to address the issue of agricultural reforms could also increase the general exclusion of agricultural trade talks from other bilateral agreements or RTAs in the near term.

However, the failure of member states to reach a consensus at Cancún does not necessarily mean that the world trade system under the WTO will collapse or that the process of trade liberalisation will be suspended indefinitely. Member states have committed to continue negotiations in Geneva. In addition, the major developed countries have voiced a commitment to aggressively pursue bilateral trade agreements in the near term. These developments signal a continual and steady decline in border protection despite the setbacks. Zero tariffs may, therefore, occur by the year 2020, particularly for developing countries. In light of the foregoing, it is likely that, even in the near term, Jamaica will have to make downward adjustments to its tariff structure. The adjustments to be made in the long term will be shaped by developments in the WTO and by regional efforts to further liberalise trade.

Trade Policy Developments in Jamaica

The trade liberalisation process embarked upon by Jamaica since the second half of the 20th century has been dictated by the economic and political realities faced by the country at different points in time. The country has alternated between relatively protectionist and liberal policies as a means of managing its trade deficits, safeguarding certain vulnerable productive sectors in the economy, ensuring the availability of foreign exchange and meeting certain political and economic commitments. Jamaica's trade policy regime has also been a reflection of the predominant trade philosophies of the time, with the implementation of more protectionist policies prior to the 1980s.

During the period 1957-1986, Jamaica's trade policy focused primarily on the use of quantitative restrictions as a means of engendering growth through export promotion and import substitution strategies. The focus was on protecting designated sectors of the economy in order to promote growth. In this regard, quantitative restrictions were imposed on a number of manufactured items, to encourage tariff-jumping and foreign direct investment in manufacturing plants. Jamaican producers were also allowed to import, duty free, many industrial raw materials during this period.

Jamaica joined the Caribbean Free Trade Association (CARIFTA) in 1968.[25] The CARIFTA Agreement called for a reduction of trade barriers between member countries on products of area origin. All import duties, quantitative import

---

24 FTAA Ministers agreed that all reductions in tariffs would be dependent on agreements made at a multilateral level under the WTO (Chaitoo, 2002).

25 The Association consisted of the following territories: Antigua and Barbuda, Barbados, British Honduras (Belize), Dominica, Grenada, Guyana, Monsterrat, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent and the Grenadines and Trinidad and Tobago.

restrictions and specific licensing requirements on goods originating in, as well as those that were imported from member countries were eliminated. There was, however, a reserve list of commodities, with most of the items being on a schedule for gradual removal of import duties. Protection had also been guaranteed to domestic producers for the importation of certain commodities, under a specific agreement.[26] Over a dozen other commodities such as ammunition, explosives and firearms, sugar and sugar substitutes, artificially sweetened beverages and certain farm machinery, among others, were subject to specific licensing requirements under other provisions of the CARIFTA Agreement. Trade in certain agricultural commodities was regulated by the Agricultural Marketing Protocol, which prohibited imports from outside CARIFTA, unless supplies from member countries were unavailable.

The overall objectives of CARIFTA were not realised due to dissenting positions by member states and subsequently, in 1973, efforts were made to strengthen, coordinate and regulate the economic and trading relationship between the members of CARIFTA, through the inauguration of the CARICOM. An essential feature of this agreement was the Common External Tariff (CET).[27] However, as efforts were made to lower tariffs within CARICOM, Jamaica increased restrictions on extra-regional trade. Quantitative restrictions applied to imports originating outside CARICOM rose from an average of 93 products in the 1960s to an average of 270 products in the 1970s.

The sharp deterioration in Jamaica's balance of payments in the 1970s culminated in the foreign exchange crisis at the end of 1976 and the introduction of a new exchange rate regime. A comprehensive system of import control was introduced as a tool to help synchronise import payments with foreign exchange inflows as the Government sought to restrict imports, particularly from extra-regional sources. Policymakers were of the view that the outcome of the balance of payments would hinge on the effective control of domestic demand. Accordingly, an essential feature of this policy was the "banned" and "restricted" lists of imports.[28] An average of 364 products were subject to quantitative restrictions, of which an average of 177 such items required specific licences.[29] The State Trading Corporation (later renamed the Jamaica Commodity Trading Company),

---

26 For example, imports of tyres and materials for retreading tyres, cement, steel, condensed and evaporated milk, flour, and certain petroleum products, were still subject to specific licensing requirements in Jamaica.

27 The CET applies to a schedule of rates of customs duties applicable to goods imported from third countries or which do not qualify as originating within the Caribbean Common Market.

28 Some of the goods for which no licences were granted were certain automobiles, canned milk, cement, cigars, citrus products, sugar and coffee.

29 The licensing requirements also existed for exports with specific licences issued for exports to countries like Cuba and the former USSR, while exports to countries like South Africa were prohibited at the time.

a government agency, was given monopoly rights on the importation of a number of consumer goods. Several adjustments to the regulation of this system were made during the course of the decade and into the early 1980s.

The 1980s marked a significant juncture for Jamaica's trade regime, with the adoption of a more open, albeit gradualist, trade policy for extra-regional trade. With the introduction of a structural adjustment programme, supported by the International Monetary Fund (IMF) and the World Bank in the early 1980s, Jamaica made a commitment not to introduce any new quantitative restrictions on imports. The first phase of the country's Tariff Reform Programme began with the gradual elimination of quantitative restrictions on imports over a five-year period (until 1987). Of the original quantitative restrictions, 124 were removed between 1982 and 1983. Restrictions on items such as packaging materials, cans and glass bottles, which were to be used in export production, were also removed. At the same time, several quantitative restrictions were converted to tariffs with the aim of progressively lowering these rates. The desired effect was to expose production for the domestic market to limited external competition, thereby encouraging domestic producers to be more competitive, while maintaining some level of protection for the local economy. The average rate of duty on all imports was relatively low during the period, at approximately 15-18 percent.[30]

Another feature of the Programme was the widening of the import base on which tariffs were applied. For example, of the total cost, insurance and freight (c.i.f.) import value of US$1144 million in 1985, US$237.0 million or approximately 21 percent was subject to duty. The measures that were implemented during the first phase of the reform programme would have increased this ratio to 34 percent.

The reform programme also sought to simplify the tariff system by narrowing the range of rates to 5-30 percent from the wide dispersion of 0-200 percent. This involved a reduction in the duty rate (customs plus stamp duty) to 68 percent of the value of imported items (c.i.f.), from in excess of 100 percent, with the stamp duty on raw material imports being reduced to 10 percent from 16 percent. The trade reform programme also sought to eliminate exemptions and ministerial remissions.[31]

The second phase of the Tariff Reform programme was implemented over a four-year period ending in March 1991. The rates applied included a 5 percent duty on items imported by the utility companies (which were previously exempt), a 10 percent aggregate import duty to be applied to raw materials, 20 percent on capital goods and 30 percent on consumer goods. During this second phase,

---

30 A major reason for the low level was the virtual exclusion by Jamaica of raw materials, intermediate products and capital goods from duties under various industrial incentive laws and the CARICOM Agreement.

31 Unless in cases of national disasters, charitable programmes, emergency situations, temporary imports, international agreements, oil, bauxite and CARICOM imports, bank and currency coins and notes and imports of the University of the West Indies, among others.

protective instruments such as quantitative restrictions were progressively phased out, with temporary protection continuing through the use of reference prices, protective duties for agricultural products, and administrative arrangements (for example, the direct importation of motor vehicles was restricted to the Jamaica Commodity Trading Company).

As previously noted, Jamaica's trade policy has also been influenced by its commitments under CARICOM. In 1990, the Common Market Council of Ministers approved the implementation of a new CET.[32] By 1992, the revised CET was approved by the Heads of Government of the Caribbean Community to be implemented on a phased basis within the time frame 1 January 1993 to 1 July 1998. During this period, the top rate of the CET would fall to 20 percent in 1998, from highs of 30-35 percent between 1993 and 1994, (see Table 1).

Table 1
Schedule of CARICOM's Common External Tariff Adjustments

Phases	Period of Application	Period to Effect Implementation	Rate -% for MDC/a	Rate -% for LDC/b
Phase I	Jan 93-Dec 94	Jan-June 1993	5-30/35%	0-5 & 30/35%
Phase II	Jan 95-Dec 96	Jan-June 1995	5-25%/30	5-25%/30
Phase III	Jan 97-Dec 97	Jan-June 1997	5-20/25%	5-20/25%
Phase IV	Jan-98	Jan-June 1998	5-20% /c	5-20% /c

Notes: /a - Refers to more developed countries in CARICOM.
/b - Refers to lesser-developed countries in CARICOM.
/c - Agriculture commodities attract a duty of 40 percent.

The tariff schedules published for 1993 (revised in 1994), 1995 and 1998 showed that Jamaica met its obligations as a signatory to CARICOM's CET Agreement. Of the top 30 commodities imported by Jamaica during the period, the average rate of protection declined from 15 percent in 1993 to 11 percent in 1998 (see Table D in the Appendix). In the context of these adjustments, the

32 The final structure of the CET gave particular consideration to the inputs used in the manufacturing process. In this regard, goods were classified as competing or non-competing. Where regional production, or immediate production potential from existing capacity amounted to over 75 percent of regional demand/consumption, then the like third country goods were deemed to be competing. The second broad classification divided goods into inputs and final goods. Inputs were further subdivided into primary inputs, intermediate inputs or capital goods. The remaining goods were deemed to be final goods. In addition, special provisions were allowed for sensitive products under a system of conditional duty exemptions. Member countries could, therefore, partially or totally suspend the application of CET rates in some cases or apply minimum rates in others.

1990s implicitly marked the third phase of Jamaica's Tariff Reform Programme. There was a progressive reduction of maximum aggregate rates of customs and additional stamp duties on goods, and the progressive widening of the tariff base through a programmed moving of items from total to partial exemption from tariff duties.

Jamaica's tariff structure has also been influenced by the country's increasing integration in the world trading system. As a signatory to the GATT and a subsequent member of the WTO in 1996, the country has committed to continue the process of reducing tariffs and eliminating other non-tariff barriers to trade. Jamaica has agreed in the WTO to bind its tariffs at levels much lower than those agreed by other countries.

Despite the reduction in tariff rates, the level of protection accorded to Jamaican industries is still significant. Additional charges are added to the duty payable on imported goods including stamp duties (which can rise to a maximum of 15 percent), an additional stamp duty of 25-56 percent on certain items (for example, meat, pork, beef products, some aluminium products, alcoholic beverages and cigarettes), a General Consumption Tax of 15 percent on imports, a Special Consumption Tax, ranging from between 5 percent and 39.9 percent[33] on specified imports, a 2 percent on all imports,[34] and an Environmental levy of $2.00 per kilogram, imposed on containers imported, manufactured or distributed in Jamaica.[35] These additional duties and taxes have effectively increased the protective level up to approximately 90 percent in some cases. Although CARICOM origin goods enjoy duty-free status and are not subject to customs import duty, local taxes such as the GCT and the SCT apply. Additionally, since 2000, slight upward adjustments were effected on specific import tariffs. In particular, the rate on chicken parts and some fruits and vegetables were raised to 260 percent in April 2002, from an average of 20 percent in 1999, in an effort to safeguard these domestic-competing industries. There have also been increases in customs and/or stamp duties applied to products for which there are no productive capacities within Jamaica. Aggregate duties for motorcars range from 67-288 percent, for commercial vehicles from 30-288 percent and for buses from 10-105 percent.

---

33 Since October 22, 1991, the General Consumption Tax (GCT) and Special Consumption Tax (SCT) have replaced several duties and taxes, for example, Excise Duty, CARICOM Duty, Consumption Duty, Entertainment Duty, Retail Sales Tax, Hotel Accommodation Tax, and Telephone Service Tax. GCT is paid on most goods and services except on zero-rated and exempt items. SCT is payable on a few items. These are alcoholic beverages, most tobacco products that attract a special consumption tax of 5 to 39.9 percent and some petroleum products. Most items attract only GCT, while some attract both GCT and SCT. The petroleum products, which attract SCT, do not attract GCT.

34 The cess was imposed on 1 May 2003 and is a temporary measure to last for one year.

35 Containers to which the levy applies include plastic material used to package soft drinks, detergents, trash bags, plastic bottles and fast-food packaging (Styrofoam).

In the context of Jamaica's commitments under the WTO and future negotiations with the EU and the prospective FTAA member states, it is likely that, in Jamaica, trade liberalisation, specifically tariff reductions, will accelerate. Under the WTO, the country has fulfilled its major commitments for the contraction in tariffs on goods and services, as well as commitments under associated agreements such as the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). In the near term, Jamaica's focus will be on the fulfilment of outstanding commitments at the multilateral level (see Table E in the Appendix). Further reductions in tariffs will, however, be directly shaped by the outcome of future ministerial conferences, which will undoubtedly be focused on the issue of reducing tariff and non-tariff barriers to trade in agricultural commodities.

In the near term, it is likely that there will be more significant declines in tariffs through bilateral agreements. The establishment of the CSME has already precipitated a contraction in tariffs through the CET, with rates ranging from 0-20 percent for goods and services originating from non-CARICOM states. The implementation of the FTAA by 2005 and the establishment of the Economic Partnership Agreement with the EU by 2007 will both call for further decreases in Jamaica's tariff structure. CARICOM negotiators will undoubtedly seek special and differential treatment for CARICOM states. However, this will likely involve a mere extension of the transitional periods for implementing obligations, rather than a continuation of the traditional, non-reciprocal preferential treatment to which CARICOM states, including Jamaica, have been accustomed (Chaitoo, 2002). In addition, since FTAA Ministers have already agreed that all tariffs will be subject to negotiations, it will be very difficult for CARICOM to exempt products from the liberalisation process.

The Impact of Trade Liberalisation

An important question that arises in the context of the accelerated multilateral trade negotiations is the extent of the impact of tariff adjustments on trade flows for small open economies such as Jamaica. Early thinking suggested that tariff reductions are unambiguously positive for economic welfare in a country, to the extent that the gains in consumer surpluses outweigh the loss in producers' surplus. A review of the recent literature does not, however, lead to a clear conclusion about the effect of a tariff on the trade balance. There are two general approaches to the assessment of the impact of tariffs on the trade balance, namely the income-expenditure approach and the intertemporal approach.

The usual analysis of the effects of a tariff considers a static model of a small open economy in which the trade balance (BT) and domestic GDP are the two variables of interest. The trade balance is a function of relative prices, $q = EP^*/P$, and real income of the domestic *(Y)* and external *(Y*)* economies.

$$BT = M^*(q) - qX(q, Y). \qquad (1)$$

Here, M* and X denote domestic imports and exports, respectively. Output is the sum of domestic expenditure E (Y) and BT:

$$Y = E(Y) + BT(q, Y) \qquad (2)$$

The imposition of an *ad valorem* tariff on imports increases the price within the importing country, stimulating production in the import-competing industry and depressing demand. These effects will both result in a reduction in imports and the trade balance would improve as a result. If the tariff revenues are not redistributed, the government improves its fiscal position. Under this assumption, output rises if import demand is sufficiently price inelastic to offset the contractionary impact of the budget surplus, but falls otherwise. In this analysis, the revenue redistribution scheme of the government will affect the size and possibly the sign of the comparative static results. Additionally, this analysis hinges critically on the type of exchange rate regime in place. With a flexible exchange rate regime, the exchange rate will adjust to make BT (.)=0. In this case, there will be a real appreciation once import demand is suppressed with the imposition of the tariff and output will remain unchanged or even fall. According to Laursen and Metzler (1950), the deterioration in the terms of trade, which lowers real income, results in a reduction in spending on domestic goods. Finally, the analysis assumes that foreigners do not respond to the tariff. If the foreign country retaliates by raising its own tariff, the effects on the trade balance, among other variables, are ambiguous.

The intertemporal approach to the analysis of an open economy also highlights the indeterminacy of welfare under tariff adjustments. This approach views the spending and saving decisions of economic agents as solutions to the problem of maximizing an intertemporal utility function subject to lifetime budget constraints. Razin and Svensson (1983) consider a model of a small open economy that produces and consumes two goods in each period, with fixed interest rates and world prices. Firms maximise profits subject to the given technology and the economy's endowment of productive factors. Consumers maximise lifetime utility subject to the constraint that the present value of their spending does not exceed the present value of their income. In such a model, the effect of a tariff depends on whether it is expected to be temporary or permanent. A temporary tariff raises the price of current consumption, relative to future consumption. Agents will substitute consumption intertemporally, consuming less in the present and more in the future, by lending in the international capital market, by running a trade surplus. In contrast, a permanent tariff will not lead agents to substitute consumption intertemporally and will therefore have negligible effects on the trade balance.

Ostry (1991) notes that the effects of tariff changes on the trade balance were largely dependent on the ease with which agents were able to substitute consumption within a period, that is, the elasticity of substitution between tradables and nontradables in a given period, versus the degree of substitution in aggregate consumption across time periods (the intertemporal elasticity of substitution in consumption). Depending on the parameter values, a temporary tariff may improve, worsen or leave the trade balance unchanged.

Given this theoretical ambiguity, the impact of trade liberalisation on the trade balance becomes an empirical issue. Ostry and Rose (1992) found no statistically significant effect of tariff changes on the real trade balance of selected

countries (including developing countries). Following trade liberalisation among several developed and developing countries in the latter half of the 1970s, Krueger (1978) indicated that there was evidence that import flows responded more rapidly than exports, causing "temporary" trade imbalances. Khan and Zhaler (1985) found that for some southern Latin American countries external shocks and inappropriate domestic policies played a significant role in under-mining attempts at trade liberalisation. Santos-Paulino (2002) argues that trade liberalisation worsens the balance of trade, as imports increases more rapidly than exports. Trade liberalisation also had an indirect effect operating through its deleterious impact on output growth, which also served to weaken the trade balance. Pacheo-Lopez (2003) found that trade reforms launched in the mid-1980s in Mexico worsened the trade balance in 1985. It was also shown that two years immediately after NAFTA was instituted, Mexico's trade balance had deteriorated.

A review of trade liberalisation in a cross-section of countries that had an IMF-supported programme requiring a reduction in trade barriers,[36] for the period 1990 to 1993, reveals that there was an even mix in the number of countries experiencing an improvement and a deterioration in their trade balance after the implementation of reforms (see Table F in the Appendix). Prior to the introduction of the IMF-supported pro-grammes, two-thirds of the countries reviewed were characterised by highly restrictive trade regimes. Most of these countries continued to implement liberal trade policies after 1993.

Impact of Tariff Adjustments on the Jamaican Economy

Empirical Framework

Following Ostry and Rose (1992), this paper considers the impact of changes in tariff rates on exports, imports, the overall trade balance and GDP over the period 1988 to 2002. The full data set includes the trade balance, real GDP, the tariff rate and the CPI-based real exchange rate as a measure of relative prices. Two implicit measures of the Jamaican tariff rate are considered: tariff revenues, inclusive of customs duties, stamp duties and general consumption tax on imports, divided by the value of imports (denoted $\tau 1$); and tariff revenues, inclusive of customs duties, stamp duties, general consumption tax on imports and the special consumption tax on fuel imports, divided by the value of imports (denoted $\tau 2$). These measures show an upward trend, particularly over the period 1992-2000, indicative of the increases in the local taxes applied to customs and stamp duties (see Figures 1a and 1b).

---

36 The review covers multiyear Fund arrangements of at least two years' duration, since these are intended to target structural reform measures, including trade reform.

Average Tariff Rates for Jamaica
(June 1988-December 2002)

Figure 1a

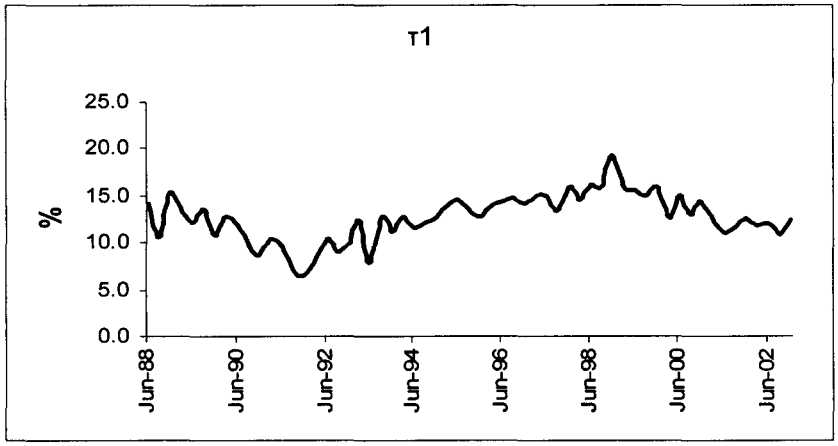
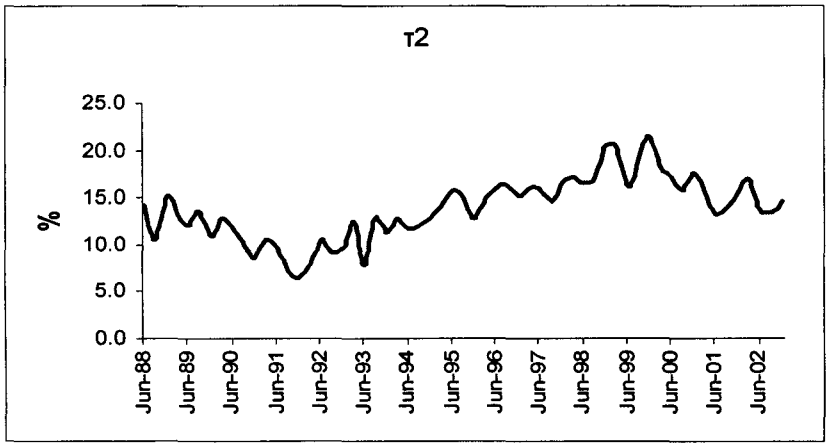


Figure 1b



Although the measures of the tariff are imperfect proxies of the effective marginal tax on imports, they implicitly capture the general movements in tariff rates over the period. Substitution bias may, however, arise from the fact that a tax on a given product may lead foreign production and domestic consumption of that product to fall. As a result, goods with very high tariffs may not be imported. The constructed tariff rate would therefore tend, *ceteris paribus*, to understate the actual tariff rate. The calculated tariff rate may also be a poor proxy for the actual level of protection, as non-tariff barriers such as tax incentives, extended to the manufacturing sector, have been used instead of tariffs as a means of protection.

Two measures of real imports were considered: real imports with fuel (denoted by RIMWF) and real imports excluding fuel (denoted by RIMNF), the latter measure being used to account for the different tax regime on fuel and the different elasticities that may be associated with fuel, given the economy's dependence on the commodity. In calculating real imports, an index of import prices using the Standard International Trade Classification (S.I.T.C.) categories was computed from data obtained from the US Bureau of Labour Statistics. This price index was then used to deflate total general merchandise imports (c.i.f.). For the calculation of the real trade balance (RTB), real exports were computed using data from the Bank of Jamaica's database, for the period 1988-2002. The volumes of Jamaica's exports were deflated using implicit prices.

Data on real gross domestic product of the USA (denoted by USRGDP), obtained from the US Bureau of Commerce, were adjusted to reflect quarterly instead of annualised flows. The quarterly data on real domestic GDP were obtained from the Statistical Institute of Jamaica (STATIN) for the period 1996-2002, while Allen (2001) provided estimates for the pre-1996 period.[37] Data on the Real Effective Exchange Rate (REER) were extracted from the Bank of Jamaica's database.

The demand for imports was modelled in a vector error correction model (VECM) of the form:

$$\Delta Z_t = \beta(L)\Delta Z_t + \delta U_{t-1} + \varepsilon_t \quad \delta < 0 \qquad (3)$$

where Z_t is a vector containing the real trade balance, real exchange rate, real domestic output, real foreign output and the tariff rate; U_t is the co-integrating vector. Z_t is also adjusted to include real imports and exports. The hypothesis that the tariff rate does not add statistically significant explanatory power to the system is then tested. This is achieved by estimating the VECM with the full set of variables (including the tariff rates), and then restricting the system by omitting the tariff rates. The variance-covariance matrix of the residuals are then recovered from both sets of estimates to compute the likelihood ratio statistics as follows:

$$(T-c)\left(\log\left|\sum_R\right| - \log\left|\sum_{UR}\right|\right)$$

$\sum_R$ and $\sum_{UR}$ are the variance covariance matrices of the residuals of the restricted and unrestricted systems, respectively. This statistic is distributed Chi square with $(nL+c)$ degrees of freedom, where n is the number of variables in the system, L is the number of lags, while c represents the number of constants or exogenous terms in the system. The Akaike Information Criterion (AIC) and

37 The two series were combined by extrapolating the series from STATIN with estimated growth rates taken from Allen (2001).

the Schwartz Information Criterion (SC) are employed to supplement the Log Likelihood ratio test.

Results

The Augmented Dickey-Fuller (ADF) test for unit root indicates that all the variables, except real exports, are I(1) (see Table G in the Appendix). The Johansen Trace and the Maximum Eigenvalue statistics from the most parsimonious VECM indicated one cointegrating relationship among the variables.

The log likelihood ratio test and the differences of the AIC and the SC statistics associated with the restricted and unrestricted systems, suggest that both measures of the tariff rate have a significant impact on the system (Table 2).

Table 2
Effect of Tariff Rates

Variables	Log Likelihood Ratio Test		AIC Test t(R - UR)		SIC Test (R - UR)	
	T1	T2	T1	T2	T1	T2
Real Trade Balance	96.64	102.40	4.20	4.41	4.96	5.17
Imports (with fuel)	96.81	107.14	3.71	4.08	4.04	4.40
Imports (no fuel)	97.09	107.15	3.72	4.08	4.05	4.40
Exports	102.89	110.47	3.93	4.19	4.25	4.51
5% critical value:	*67.5*					

The long-run equilibrium coefficients in the VECM (Table 3) point to the relative impact of the tariff rates on the variables of interest. In relation to the long-run behaviour of the real trade balance, both measures of the tariff rate are insignificant at the 5 percent level. However, $\tau 2$ has the right sign and is significant at the 10 percent level, which implies that the imposition of the non-duty taxes and taxes on fuel on international trade play an important role in affecting trade volumes. The impact of the tariff is more important for imports (both including and excluding fuel) and there is no discernible difference between the responses of the two measures of imports. Real exports are, however, not significantly affected by tariff adjustments, which is consistent with *a priori* expectations. Importantly, the REER and GDP (both domestic and foreign) are correctly signed and significant in the long run.

Table 3
Normalised Long-Run Coefficients

Variable	REER	JGDP	USGDP	τ1	τ2
RTB	-2.80 -(2.88)	2.35 (0.80)	25.03 (8.89)	1.34 (0.46)	
RTB	-2.18 -(1.12)	13.98 (2.41)	57.29 (9.49)		-9.03 -(1.48)
RIMPWF	1.46 (13.76)	4.05 (14.55)		-2.62 -(3.90)	
RIMPWF	1.74 (9.53)	4.75 (12.20)			-2.92 -(3.64)
RIMPNF	1.36 (14.70)	3.92 (16.16)		-2.12 -(3.63)	
RIMPNF	1.57 (9.80)	4.50 (13.20)			-2.28 -(3.23)
REXP	-0.72 -(3.79)		1.29 (6.51)	1.26 (1.20)	
REXP	-0.77 -(3.99)		1.17 (5.18)		1.55 (1.50)

Note: Numbers in parentheses are t-statistics.

The short-run responses of imports, as captured by the impulse response functions presented in the Appendix (Figure A), are consistent with *a priori* expectations. Imports experience an immediate contraction over the first two quarters following the shock, but fall at a slower rate thereafter for up to two years. The responses of imports to shocks to τ1 are more erratic over the short term.

To account for policy shifts during the sample period, the VAR systems were estimated using a reduced sample of 1991:01 to 2002:04, the period during which the most significant tariff adjustments occurred. Moreover, the paper evaluates whether or not the change in the exchange rate regime after 1991 would have a significant influence. The results, however, remained unchanged.

The hypothesis that the tariff rates considered in this paper are weakly exogenous[38] was also tested. Outside of the statistical efficiency gains associated with accounting for exogeneity, this issue has an intuitive appeal in that it can be established whether or not adjustments in tariff rates (including measures geared at enhancing compliance) in Jamaica are in response to the behaviour of selected macroeconomic variables, such as the current account. Table 4 presents

38 Ostry and Rose (1992) treated tariff rates as exogenous.

likelihood ratio statistics associated with the test proposed by Engle, Hendry and Richard (1983) for weak (long-run) exogeneity.

Table 4
Tests for Weak Exogeneity: Tariff Rates in Jamaica

	τ1		τ2	
System Including	Likelihood Ratio	P-Val	Likelihood Ratio	P-Val
RIMPNF	5.31	0.02	2.45	0.12
RIMPWF	5.10	0.02	2.03	0.15
RTB	2.57	0.11	6.30	0.01
REXP	0.66	0.42	6.84	0.01

τ1 is weakly exogenous in the systems that include the real trade balance and exports, but appears endogenous in both systems that include imports. The reverse is true for τ2. The tariff rate appears to be endogenous in the systems that include imports, but is weakly exogenous in the systems that include the trade balance and exports. The analysis therefore suggests that tariff rates in Jamaica are not necessarily adjusted only in response to external factors, such as trade negotiations.

Block exogeneity (short-run) tests (in Tables H and I in the Appendix) support the view that imports, exports (in the case of ô1) and, by implication, the trade balance, are significantly affected by their determinants, inclusive of the two measures of protection. The tariff rate is exogenous in all cases, however, except for τ2 in respect of the real trade balance. Of note, the REER is exogenous in all the systems. Selected pairwise Granger causality (GC) tests suggest that real imports are Granger-caused by domestic GDP, (the REER and the tariff rate does not significantly add to the explanation of real imports), while bivariate Granger causation exists for real exports and US GDP.

Conclusion

Given the trends in multilateral, regional and bilateral negotiations, there is a likelihood that tariffs will be eliminated by the year 2020. This is expected to have a significant adverse impact on the Jamaican balance of payments. As the results indicate, imports appear to be sensitive to these adjustments. In all likelihood further increases in imports are anticipated in the near term. The country has no *immediate* commitment to further liberalise trade, but given the advent of the FTAA and the ACP/EU EPA, tariff adjustments will become almost unavoidable in the medium term.

In the context of the current balance of payments deficit, future tariff adjustments are to be approached with caution because of their potential adverse impact on the external accounts and the broader macro economy in the near to medium term. At least, a reasonable adjustment period should be negotiated, as this would minimise the adverse macroeconomic effects. In addition, policies aimed at encouraging the production of tradable goods and services at competitive prices are essential to ensuring a sustainable external position. This could involve efforts to enhance macroeconomic stability and reduce security costs in Jamaica. The private sector could also be assisted, through the organs of the state, to take advantage of new trade opportunities and market outlets. Innovation should be promoted through research development, as well as the establishment of a regulatory framework that is favourable for globalisation and trade liberalisation. Importantly, effort must be made to take advantage of the safeguard measures under the GATT, that allow developing countries to restrict imports, for temporary periods, in emergency situations, or in order to promote the development of new and/or infant industries.

References

Chaitoo, R. 2002. "Tariff Negotiation Methods and Modalities in the FTAA: Implications for CARICOM". *Caribbean Regional Negotiating Machinery.*

Dornbusch, R. 1987. "External Balance Correction: Depreciation or Protection?" *Brookings Papers on Economic Activity.* 1: 249-269.

Engle, Robert F., David F. Hendry and Richard Jean- Francois. 1983. Econometrica, Volume 51, Issue No. 2, pp. 277-304.

External Trade (Several Issues), *Statistical Institute of Jamaica.*

Hudson, S., and R. Stennett. 2003. "Current Account Sustainability in Jamaica", Working Paper 02/11, *Bank of Jamaica,* June.

Khan M., and R. Zahler. 1985. "Trade and Financial Liberalisation Given External Shocks and Inconsistent Domestic Policies". *IMF Staff Papers,* 32: 22-25.

Krueger, A. 1978. "Foreign Trade Regimes and Economic Development: Liberalisation Attempts and Consequences". Lexington, MA: Ballinger Press for NBER.

Laursen, S. and L. Metzler. 1950. "Flexible Exchange Rates and the Theory of Employment". *Review of Economics and Statistics* 32: 281-299.

Ministry Papers (Several Issues), Ministry of Finance and Planning, Jamaica.

Ministry Papers (Several Issues), Ministry of Foreign Affairs and Foreign Trade.

Ostry, J. D. 1991. "Trade Liberalisation in Developing Countries". *IMF Staff papers*, 38 (3), September: 447-479.

Ostry J.D. and A.K. Rose. 1992. "An Empirical Evaluation of the Macroeconomic Effects of Tariffs". *Journal of International Money and Finance*, Vol. II: 63-79.

Pacheco-Lopez, P. 2003. "The Impact of Trade Liberalisation on the Trade Balance, the Balance of Payments and Economic Growth: The Case of Mexico", mimeo, Department of Economics, University of Kent.

Razin, A. and L. Svensson. 1983. "The Terms of Trade and the Current Account: The Harberger-Laursen-Metzler Effect". *Journal of Political Economy*, Vol. 91 (1): 97-125.

Santos-Paulino, A. 2002. "Trade Liberalisation and the Balance of Payments in Selected Developing Countries", Department of Economics, Keynes College, University of Kent.

Schott, J. 2003. "Unlocking the Benefits of World Trade", *The Economist*, 1 November.

The Customs Act. 1993. General Provisions to the First Schedule, Ministry of Finance and Planning, Jamaica.

The Customs Act. 1995, 1999. The Customs Tariff (Revision) (Amendment), Ministry of Finance and Planning, Jamaica.

The Jamaica Gazette Supplement. Proclamations. Rules and Regulations. 2002. Vol. CXXV, Friday, 26 April. No.24.

U.S. Trade Agenda. 2003. Office of the US Trade Representative.

World Trade Organisation. *The GATT Years: from Havana to Marrakesh.*

World Trade Organisation. *Annual Report* (Several Issues).

World Trade Organisation. International Trade Statistics (Several issues).

Appendix Tables

Table A
Chronology of Trade Liberalisation under the GATT/WTO

Imple-mentation Period	Place/Name of Round	Subjects Covered	Countries
1947	Geneva	Tariffs (Industrial Goods)	23
1949	Annecy	Tariffs (Industrial Goods)	13
1951	Torquay	Tariffs (Industrial Goods)	38
1956	Geneva	Tariffs (Industrial Goods)	26
1960-61	Dillon Round	Tariffs (Industrial Goods)	26
1964-67	Kennedy Round	Tariffs and Anti-dumping measures	62
1973-79	Tokyo Round	Tariffs, non-tariff measures, "framework agreements"	102
1986-1994	Uruguay Round	Tariffs, non-tariff measures, rules, services, intellectual property, dispute settlement, textiles, agriculture, creation of WTO	123
2001-2005	Doha Round	Uruguay Round implementation concerns, agriculture, services, market access (non-agriculture), intellectual property, investment, treatment competition, transparency in government procurement, trade facilitation, anti-dumping, subsidies, regional agreements, dispute settlement, environment, e-commerce, small economies, trade, debt and finance, trade and technology transfer, technical cooperation, least-developed countries, special and differential	143

Source: WTO Secretariat.

Note: The Seattle Ministerial in 1999 and the Cancun Ministerial in 2003 have been excluded from the list, as these were primarily mid-term reviews that were generally deemed to be unsuccessful rounds.

Table B
Reductions in agricultural tariffs and subsidies in the Uruguay Round

	Developed Countries 6 yrs: 1995-2000	Developing Countries 10 yrs: 1995-2004
Tariffs		
Average cut for all agricultural products	-36%	-24%
Minimum cut per Product	-15%	-10%
Domestic support		
Cuts in total support for the sector	-20%	-13%
Exports		
Value of subsidies (outlays)	-36%	-24%
Subsidised quantities	-21%	-14%

Source: WTO Secretariat.

Table C
Average FTA Applied, MFN Tariffs and WTO Bound Rates for Selected Group of FTAs

FTAs	Tear	RTA Applied Rates/a	MFN Applied Rates	WTO Bound Rates
CARICOM		**0.0**	**11.7**	**59.6**
Antigua and Barbuda	2000		14.5	58.7
Dominica	2001		13.1	58.7
Grenada	2001		11.2	56.6
Guyana	2001		11.7	56.7
Jamaica	2001		10.7	49.8
St. Kitts and Nevis	2001		11.5	75.9
St. Lucia	2001		10.1	61.9
St. Vincent	2001		10.9	62.5
Trinidad & Tobago	2001		11.2	55.7
NAFTA		**1.6**	**8.0**	**14.7**
Canada	2000		4.4	5.1
Mexico	1997		15.5	34.9
USA	2001		4.0	4.0
MERCOSUR		**0.1**	**10.6**	**32.3**
Argentina	2001		11.6	31.9
Uruguay	2001		11.0	31.7
Brazil	2001		12.9	31.4
Paraguay	2001		10.7	33.5
Chile	2001		8.0	25.1
Bolivia	2001		9.3	40.0
ASEAN		**3.9**	**8.1**	**22.0**
Indonesia	2001		8.0	37.1
Malaysia	2001		9.2	14.5
Philippines	2001		7.0	25.6
Singapore	2001		0.0	6.9
Thailand	2001		16.5	25.7
SADC	**5.2**	**14.5**	**77.1**	
South Africa	2002		10.7	19.1
Congo, Dem. Rep.	2001		18.6	96.2
Tanzania	2000		17.9	120.0
Zimbabwe	2001		19.0	94.1
Botswana	1996		11.1	18.8
Mozambique	2001		13.4	97.5
Mauritius	2001		10.6	93.9

Source: WTO Secretariat.

Note: /a – approximate values.

Table D
Average Tariffs Applied on Jamaica's Main Import Items

	1993	1995	1999
Consumer Goods			
Food			
Aerated water	30.0	25.0	20.0
Infant Formula	20.0	17.5	10.0
Fish (Snapper, mackerel etc.)	26.1	25.5	28.4
Chicken & Parts Thereof	20.0	24.0	28.7
Non-Durables			
Medicaments	9.8	10.24	15.0
Printed Books/Periodicals	0.0	0.0	0.0
Napkins/sanitary towel/Diapers/ Toilet Tissue	26.7	23.3	20.0
Paper/Paperboard	5.0	0.0	0.0
Other Non-Durables			
Jewellery	30.0	30.0	30.0
Watches and Calculators	30.0	30.0	30.0
Semi-Durables			
Tennis Shoes/Slippers/Footwear	21.3	22.8	15.8
Articles of Plastic	13.9	11.2	7.4
Durables			
Motor Cars	19.8	19.8	25.0
Raw Materials			
Food			
Corn Seed	0.0	0.0	0.0
Refined Sugar	40.0	0.0	0.0
Wheat	0.0	0.0	0.0
White Rice	30.0	25.0	25.0
Industrial Supplies			
Sodium Hydroxide (Caustic Soda)	5.0	0.0	0.0
Paper Products (paper, boxes)	19.0	13.9	10.6
Bottles/Bottles for Soft-drinks/Jars	15.0	10.0	4.6
Fuels			
Bunker (c grade oil)	15.0	15.0	10.0
Motor Spirit Gasoline (Unleaded)	3.8	3.8	3.8
Parts & Accessories			
Parts for Aircraft engines	5.0	5.0	0.0
Tyres	10.3	7.0	6.7
Parts/Accessories for M/V	8.2	8.6	13.9

Table D- Cont'd
Average Tariffs Applied on Jamaica's Main Import Items

	1993	1995	1999
Capital Goods			
Transport Equipment			
M/V for transport of goods	7.7	5.8	5.8
Coaches and Buses	7.9	5.4	5.7
Construction Materials	16.5	10.9	8.4
Machinery & Equipment			
Telephonic & Telegraphic Applications	5.0	5.0	5.0
Data Processing Equipment	5.0	5.0	0.0
Average Tariffs for Selected Items	14.9	12.0	11.0

Source: The Customs Tariff Schedule 1993, The Customs Tariff Revision, 1995, 1999, Jamaica.

Table E
Jamaica's Schedule of Near-term Commitments

Levels		Implementation Period				Comments
		2004	2005	2006	2007	
Multilateral	WTO					
	Subsidies & Countervailing Measures				X	
	TRIPs		X			
Regional	CSME	X				
	Economic Partnership Agreement				X	For implementation 1 January 2008
	FTAA		X			
Bilateral	CARICOM/Costa Rica		X			Outstanding issues to be addressed
	CARICOM/Cuba	X				Provisionally applied since December 2002
	CARICOM/Dominican Republic	X	X			Signed in 1998. Trade in majority of goods to have been implemented in 2003 with the remainder in 2004. Outstanding issues remain

Table F
A Review of the Impact of Trade Reform Measures on the Trade Balance of Selected Countries with IMF-Supported Programmes

Countries	IMF Programmes				Trade Balance			
	ESAF	EFF	SAF	SBA	5 Yrs. Before	Year of Imple-mentation	5 Yrs. After	Effect
Africa								
Benin	1/25/93				-8.70	-7.97	-5.81	+
Burkina Faso	3/31/93				-8.84	-8.26	-10.90	-
Equatorial Guinea	2/3/93				-11.39	6.20	-10.12	-
Ethiopia			10/28/92		-6.36	-11.08	-9.66	+
Lesotho	5/22/91				-101.33	-107.60	-88.94	+
Mali	8/28/92				-5.32	-5.97	-4.06	+
Mauritania	12/9/92				6.62	-4.91	8.98	+
Mozambique	6/1/90				-31.46	-46.87	-30.24	+
Sierra Leone	4/3/92				0.38	1.67	-10.49	-
Zimbabwe	9/11/92	1/24/92			3.99	-3.77	2.07	+
Asia								
Bangladesh	8/10/90				-8.69	-5.47	-4.51	+
Mongolia	6/25/93				-3.85	3.89	1.70	-
Nepal	10/5/92				-13.26	-10.74	-21.41	-
Philippines				2/20/91	-4.36	-7.07	-11.66	-
Sri Lanka	9/13/91				-7.45	-8.94	-7.42	+
Europe								
Hungary		2/20/91			1.12	1.07	-5.71	-
Poland		4/18/91			1.95	-0.93	-2.23	-
Middle East								
Egypt				5/17/91	-7.65	-15.82	-12.52	+
Jordan				2/26/92	-24.52	-33.47	-27.12	+
Western Hemisphere								
Argentina		3/31/92			5.16	-0.61	-0.35	+
Guyana	7/13/90				1.07	n.a.	-11.24	-
Jamaica		12/11/92			-10.77	-11.48	-14.87	-
Panama				2/24/92	-2.34	-5.16	-5.65	-
Peru		3/18/93			-0.03	-2.12	-3.54	-

Source: International Monetary Fund.
Notes: Enhanced Structural Adjustment Facility (ESAF), Extended Fund Facility (EFF), Structural Adjustment Facility (SAF), Stand-By Agreement (SBA).

Table G
Unit Root Tests

Variables	ADF			
	Lags	Levels	Lags	1st Diff
Trade Balance	7	1.0	6	-4.6
Tariffs				
$\tau 1$	1	-1.6	0	-14.8
$\tau 2$	2	-1.1	1	-8.7
Other				
USGDP	4	0.6	2	-27.6
REER	1	-1.0	0	-5.7
JGDP	2	-3.6	1	-10.2
Imports				
RIMPNF	4	-0.2	3	-4.0
RIMPWF	4	-0.1	3	-4.1
Real Exports	3	-4.0		
1% Critical Values:		-3.6		-3.6

Table H
Pairwise Granger Causation Tests

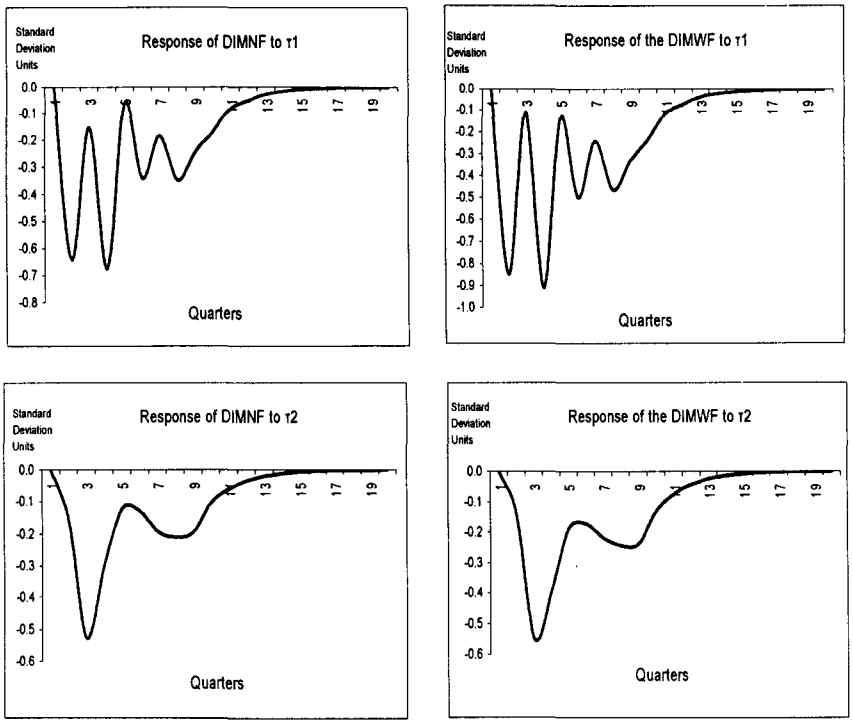
	Chi-sq	p-value	Chi-sq	p-value
Dependent variable: D(RIMPWF)				
D(REER)	2.18	0.14	2.13	0.14
D(JGDP)	5.32	0.02	4.71	0.03
$D(\tau 1)$	0.67	0.41	0.03	0.86
Dependent variable: D(REER)				
D(RIMPWF)	0.00	1.00	0.00	0.99
D(JGDP)	1.77	0.18	1.75	0.19
$D(\tau 1)$	1.86	0.17	0.27	0.60
Dependent variable: D(JGDP)				
D(RIMPWF)	1.03	0.31	0.09	0.76
D(REER)	0.99	0.32	0.46	0.50
$D(\tau 1)$	5.30	0.02	0.83	0.36
Dependent variable: D(ô1)				
D(RIMPWF)	2.55	0.11	0.04	0.84
D(REER)	0.83	0.36	0.00	0.95
D(JGDP)	0.39	0.53	0.93	0.33

Table I
Pairwise Granger Causation Tests

	Chi-sq	p-value	Chi-sq	p-value
Dependent variable: D(REXP)				
D(REER)	0.35	0.55	0.51	0.48
D(USGDP)	4.84	0.03	3.59	0.06
D(τ1)	0.89	0.35	2.17	0.14
Dependent variable: D(REER)				
D(REXP)	0.02	0.90	0.05	0.83
D(USGDP)	0.64	0.42	1.41	0.23
D(τ1)	0.47	0.49	0.22	0.64
Dependent variable: D(USGDP)				
D(REXP)	9.35	0.00	6.18	0.01
D(REER)	0.45	0.50	0.79	0.37
D(τ1)	0.55	0.46	2.51	0.11
Dependent variable: D(ô1)				
D(REXP)	0.28	0.60	1.17	0.28
D(REER)	0.00	1.00	0.07	0.79
D(USGDP)	0.15	0.70	2.32	0.13

Figure A

Impulse Responses



Section G:
Economic Governance of Caribbean Countries

23

Debt and Fiscal Sustainability in Barbados

Xiomara Archibald, Kevin Greenidge & Carlos Holder

Abstract

The question of debt and fiscal sustainability is very important for adequate macroeconomic management. The paper looks at the sustainability of the Government of Barbados' policies with respect to the financing of public expenditure and debt management in the post-independence era. Using recent econometric techniques, the paper examines the sustainability of the historical fiscal process implied by the government's present value budget constraint. The findings suggest that this process has, in fact, been sustainable and point to prudent public sector policies by the fiscal authorities.

1. Introduction

The development literature stresses the need for governments of small, open, developing economies, like Barbados, to run fiscal deficits in order to stimulate economic growth. For instance, the government of a country can build up enough capital stock in one period to place the economy on its steady state growth path by running a fiscal deficit and issuing debt to cover it. This debt can then be repaid in the next period, since the economy has already achieved a high-growth equilibrium. Mankiw (2000) lists three other reasons why budgetary flexibility may be preferable to a balanced-budget rule: stabilisation of the economy through the action of the automatic fiscal stabilisers; reduction in the distortion caused by the incentives in the tax system *via* tax smoothing; and shifting of the tax burden from current to future generations, who will arguably share in the benefits of the current generation's expenditures.

Nevertheless, in light of the experiences of some developing countries - particularly in Latin America and Sub-Saharan Africa - where widening deficits

have been accompanied by spiralling debt and inflation, one might be tempted to surmise that governments of developing countries would be better off balancing their budgets. However, these problems are seen as largely attributable to a lack of fiscal discipline, whereby populist fiscal policies have prevailed and debt and seignorage have been allowed to reach unsustainable levels. The recent example of Argentina illustrates this point, with most economists agreeing that fiscal mismanagement was largely responsible for the current crisis. Hence, debt crises and hyperinflation do not make a case for balanced budgets but serve instead to underscore the need for governments to pursue *sustainable* fiscal policies.

The effects on debt and inflation aside, fiscal policy also has important implications for the balance of payments, especially under a fixed exchange rate regime. Indeed, many economists consider that Argentina's fixed exchange rate made it impossible to sustain the country's excessively large deficits. This suggests that in a much smaller and far more open economy with a fixed exchange rate, such as Barbados, fiscal policy becomes even more crucial. Any increase in Government spending will indirectly and adversely affect the level of foreign currency reserves.

The Government of Barbados has recently issued international bonds to build up the reserves, which have acted as a buffer against the current unfavourable economic climate and ongoing trade liberalisation. Nevertheless, with the Argentine crisis still fresh in people's memories and with recent increases in the size of the deficit and the level of public sector indebtedness, fiscal policy is increasingly coming under the microscope in Barbados, sending policy makers in search of the most appropriate, sustainable measures with which to re-stimulate economic growth.

In this regard, policy makers are constrained, not only by the Government budget, but also by the on-going process of Caribbean regional integration: there is a pressing need for convergence of Barbados' tax rates with those of other CARICOM members in order to encourage Barbadian businesses and human capital to remain at home. In fact, the Barbados Government has already made significant progress in realigning (that is, adjusting downwards) the domestic tax rates on both personal and corporate income. In addition, the fixed exchange rate acts as yet another constraint on fiscal policy. More specifically, economic theory holds that under a fixed exchange rate regime there is limited scope for raising revenue through seignorage if balance of payments problems are to be avoided.

In the context of a developing economy, expenditure cuts would be considered only as a last resort. Of course, there are a number of expenditure adjustments that could be made, tariffs that could be increased and existing welfare schemes which could be better targeted. However, in the current economic environment it may be necessary to move beyond these efficiency measures which may result in a widening of the deficit as well as in debt levels. Therefore, debt is an appropriate variable to target in devising a fiscal policy that is sustainable.

It is within this context that this paper seeks to evaluate the sustainability of the Government of Barbados' fiscal policies in the post-independence era. It is important to note that the key concept in this study is that of the *sustainability* of fiscal policy, which refers to the ability of the Government to maintain a given

policy stance in the future in spite of any shocks to the system which may arise. This notion is not synonymous with that of *optimality*, with an optimal policy being that which gives the most desirable outcome possible.

2. Evolution of Fiscal Policy

The Government of Barbados has consistently recorded a fiscal deficit since independence, as greater emphasis has been placed on income redistribution, that is, increasing levels of public goods provision in the areas of health, education, housing and social security. The greater relative importance attached to capital expenditure in the Government budget can be seen in the fact that, despite recording overall deficits, the Government has continued to run recurrent surpluses.

The evolution of the fiscal deficit between 1966 and 2001 can be divided into several phases: 1966-1973, 1973-1980, 1981-1990 and 1991-2000, with the year 2001 in a sub-period by itself. As previously mentioned, in the years immediately after independence, the government was slow to shake off the influence of colonial budgetary policy. For this reason, deficit financing did not become an important aspect of fiscal policy until the late seventies, when the government took advantage of high levels of liquidity to obtain funds at low interest rates, thus embarking on an expansionary fiscal policy programme geared towards reducing unemployment. Nevertheless, up until 1980 the deficit was large but relatively well managed (*see* Haynes and Holder (1987) and Howard (1989)).

The year 1981, however, saw a huge deficit of 9.5% of GDP, which Howard (1989) attributes to the fact that this year was an election year, during which a massive capital works programme was initiated at the same time that the world economy was in recession. Haynes and Holder (1987) cite other factors such as a 1980 income tax reform, which led to a slowdown in revenues, as well as declines in the tourism and sugar sectors. This ushered in a period characterised by consistently high deficit to GDP ratios, due to the continued application of expansionary fiscal policy as a result of heavy spending on several developmental projects.

In 1990 another record deficit was registered, to the tune of $236.7 million (nearly 7% of GDP), as the Barbadian economy slipped into recession. The severity of this recession convinced Government of the need for fiscal restraint. Government reduced the fiscal deficit in 1991 by introducing a number of revenue-raising measures and slashing capital expenditure. Projects were put on hold, with work on a number of school premises, health facilities and roads grinding to a halt. Towards the end of 1991, difficulty in securing non-Central Bank financing forced the Government to further reduce expenditure through lay-offs and the implementation of an 8% cut in public sector wages. As a result, the deficit averaged just over $60 million (less than 2% of GDP) between 1991 and 2000. The year 2001 brought another recession in the Barbadian economy and a concomitant increase in the fiscal deficit, which rose to 3.5%.

3. Evaluating Fiscal Sustainability

3.1 Defining Fiscal Sustainability

The literature argues that fiscal policies are sustainable if they lead to a situation in which the country can satisfy its budget constraint. Of course, a government can always choose to satisfy its budget constraint by simply defaulting or by inflating away its debt. Thus, there must be some form of value judgment in any analysis of fiscal sustainability as to the cost and benefits of different adjustment mechanisms. In this regard, it is usually assumed that a government would prefer adjustments through the level and composition of its primary fiscal position as opposed to adjustments via default or inflation.

A recent study by the IMF posits that a set of policies is unsustainable if it leads to insolvency (solvency is defined as a situation in which the future paths of spending and revenue satisfy the inter-temporal budget constraint). However, they suggest that solvency is only a necessary condition for sustainability because solvency could be achieved with very large and costly future adjustments. Sustainability, however, requires achieving solvency with unchanged policies. In their view, a policy stance is sustainable if "a borrower is expected to be able to continue servicing its debt without an unrealistically large future correction to the balance of income and expenditure" (IMF, 2002, p. 4).

With these considerations in mind, we define as sustainable a situation that satisfies two conditions: (i) a country can satisfy its current period budget constraint without resorting to default or excessive debt monetization; and (ii) a country does not keep accumulating debt while knowing that a major future adjustment will be needed in order to be able to service its debt.

3.2 Assessing Fiscal Sustainability

The two most common approaches in the literature to evaluating fiscal policy sustainability are the accounting approach, which focuses on how far fiscal policy departs from sustainability, and the present value budget constraint (PVBC) approach, which investigates past fiscal data to see if/whether there is a long-term equilibrium relation between government revenues and expenditures or if government debt follows a stationary process.

3.2.1 The Accounting Approach

The accounting approach attempts to determine the sustainable fiscal deficit by making assumptions that liabilities can continue to grow at the growth rate of the economy's GDP, so that debt/GDP ratios remain constant. It uses rule-of-thumb indicators aimed at checking whether current policies can stabilise or reduce a given debt ratio. In other words, the question being asked here is what level of primary surpluses must the government run, now and in the future, to maintain the current debt/GDP ratio or even reduce it.

In this regard, there are two such indicators that we can examine. The first is the Primary Gap indicator, proposed by Blanchard (1990) and further developed by Buiter (1993). It focuses on stabilising the ratio of public sector debt to output.

For projected paths of the real interest rate and output growth, the one-period primary gap specifies a benchmark primary balance consistent with an unchanged debt ratio, whereby fiscal policy is sustainable if the primary balance is greater than the benchmark. This indicator is desirable for its simplicity of application, as it requires only the current values of the real interest rate, debt, the primary balance and economic growth. However, it may give a distorted picture of the amount of adjustment required as a result of cyclical variations in public sector revenues and/or expenditures or current real interest rates or growth rates which are not representative of their respective average values in the long run.

The second indicator, the permanent primary gap, gets around this by using the long-run real interest rate and the long-run growth rate. Hence, it is capturing the magnitude of the permanent adjustment in the actual and planned primary balance to output ratios that would ensure fiscal solvency, that is, the excess of the required permanent primary balance to GDP ratio over the actual permanent primary balance to GDP ratio.

3.2.2 Results of the Accounting Approach

Table 1
Results of Primary Gap Analysis
(One-period and Myopic Permanent)

BDS $million / %	
One-Period Primary Gap	**3.2%**
Real Interest Rate	4.4%
Required Primary Balance to GDP (1-period)	5.0%
Actual Primary Balance to GDP	1.8%
Permanent Primary Gap (long-run)	**-0.8%**
Long-run Interest Rate on Debentures	7.0%
Long-run Inflation Rate	2.5%
Long-run Real interest Rate	4.5%
Long-run Growth Rate	3.0%
Required Primary Balance to GDP (long-run)	1.0%

The one-period primary gap calculated for Barbados (Table 1) suggests that the necessary fiscal adjustment is equivalent to 3.2% of GDP. However, this is a short-run requirement, which reflects the large increase in the fiscal deficit in 2001 and does not speak to long-run sustainability of fiscal policy. The long-run primary gap, on the other hand, has a negative value of –0.8% of GDP, which suggests that fiscal policy is in fact sustainable in the long-run, as the actual permanent primary balance is greater than required.

3.2.3 The PVBC Approach

In defining sustainability above, we conclude that fiscal policies are sustainable when the PVBC is satisfied without a major and abrupt correction having to be made in the balance of income and expenditure to avoid solvency and liquidity problems. In this regard, we can derive the PVBC by starting with the one-period budget constraint for the consolidated Public Sector and solving it N periods forward.

$$B_{t-1} \equiv \sum_{j=0}^{\infty} \frac{R_{t+j} - E_{t+j}}{(1+i_t)^{j+1}} + \lim_{N\to\infty} \frac{B_{N+1}}{(1+i_t)^{N+1}} \qquad (1)$$

where B_t, E_t, R_t, and i_t are government debt, govern-ment expenditure and government revenue, all in nominal terms, at time t. It states that the existing stock of public debt must be equal to be identical to the present value of future primary balances (first term on right) plus the present value of the stock of debt (second term on right). It implies that the value of the public debt today must be matched by an excess of future primary surpluses over primary deficits in present value terms.

The PVBC has a number of implications for fiscal sustainability: firstly, the expected present value of the resources available to the public sector for the servicing of its debt (including seignorage) must be at least equal to the initial stock of debt; secondly, public sector debt cannot be continuously rolled over, that is, repayment of the principal must take place at some point (referred to in the literature as the 'no Ponzi game' (NPG)[1] condition; in other words, a sustainable fiscal policy should ensure that the PV of the stock of public debt goes to zero in infinity, constraining the debt to grow no faster than the real interest rate); and thirdly, while the PVBC does not rule out large fiscal deficits or debt ratios, government is required to run some primary surpluses in the future. The Government may bring about these surpluses through a combination of some or all of the following policy options: reducing expenditure; increasing revenue through taxes, grants or privatisation proceeds; monetising the debt, that is, printing money to cover the debt (which is really an inflation tax); defaulting on some or all of the public debt, effectively taxing holders of Government debt; or, finally, shifting between debt sources to take advantage of lower interest rates.

The PVBC therefore presents two complementary definitions of sustainability that we can use for empirical testing:

i) The value of public current debt must be equal to the sum of future primary surpluses.

---

1 A government is said to be playing a Ponzi game when it just keeps on paying old debt by issuing new ones.

ii) The present value of public debt must approach zero in infinity (the NPG condition).

On the first, if we assume that the real interest rate is stationary with mean *r*, plus two additional definitions of $GG_t = G_t + i_t B_{t-1}$ and $E_t = G + (i_t - i)B_{t-1}$, we can re-express equation 1 as:

$$GG_t - R_t \equiv \Sigma_{j=0}^{\infty} \frac{1}{(1+r_t)^{j-1}} (\Delta R_{t+j} - \Delta E_{t+j}) + \lim_{N \to \infty} \frac{B_{N+1}}{(1+i_t)^{N+1}} \qquad (2)$$

Now we can assess fiscal policy sustainability using cointegration analysis (investigating whether or not there exists over time an equilibrium relationship between *R* and *E*, which even if they deviate from in the short-run, they must eventually return to). Suppose *R* and *E* are non-stationary in levels (meaning that they are growing over time) so that their first difference is stationary (not growing over time), implying that the first term on the right-hand side is stationary, then, the left-hand side must also be stationary. Therefore, both *GG* and *R* must be integrated of order one, and should be cointegrated (moving together in the long run). The intuition behind this is that although government revenue and expenditure may grow over time, a stable equilibrium (cointegrating) relationship should exist between them. If, for example, government expenditure is non-stationary, *I(1)*, while government revenue is stationary, *I(1)*, then there is no long-term or equilibrium relation between them. This implies that government is violating its intertemporal budget constraint because expenditure tends to increase with time, while revenue does not.

The regression for the cointegration test in this case is $R_t = a + \beta GG_t + \mu_t$, where the null hypothesis of cointegration (long-run stationary relationship) between the two non-stationary variables is tested with $b = 1$ and μ_t being stationary. If there is no cointegration the PVBC does not hold and the fiscal deficit is not sustainable. However, the condition *b=1* is not, strictly speaking, a necessary condition for the government's budget constraint to hold. Hakkio and Rush (1991) showed that when GG_t and R_t are in levels, as opposed to a percentage of GDP or in *per capita* terms, the condition $0 < b < 1$ is a sufficient condition for the budget constraint to be obeyed.

In order to test the absence of Ponzi games (which is simply the complementary definition) we can test the stationarity of the first difference (changes) of the stock of public debt, using unit root tests. If stationary, the debt is sustainable, otherwise the PVBC is not fulfilled (specifically, the second term on the right-hand side does not converge to zero over time).

3.3 Results of the PVBC Approach

Using data on real revenue, *RR*, and expenditure, *RG*, (the latter includes interest payments, which is consistent with the form of Equation 2) spanning the period 1974:2 to 2001:4, we investigated fiscal sustainability for Barbados. Figure 1 plots real revenue and real spending. Although a clear upward trend can be identified in both series (suggesting that they are non-stationary), there appears to be a definite stable relation between them. Consequently, it is expected that these variables will be non-stationary and cointegrated.

The first step is to determine the order of integration of the two series (that is, are they stationary or not). In this regard, a number of stationarity tests are applied to the levels and first differences of the variables. The results are presented in Table 2.

All the above tests are applied over the period 1974:2 to 2001:4 and also for the sub-periods: 1974:2-1979:4, 1980:1-1990:4 and 1991:1-2000:4, where the analysis in Section 2 suggested that there might have been a shift in fiscal policy behaviour. The results indicated that both series are non-stationary in levels and stationary in their first differences at the 1% level, for the entire sample and also for the sub-periods chosen.

Having established that the series are non-stationary, implying that they have been growing over time (which is not surprising see Figure 1), it makes

Figure 1. Real Revenue and Expenditure (1974:2-2001:4)

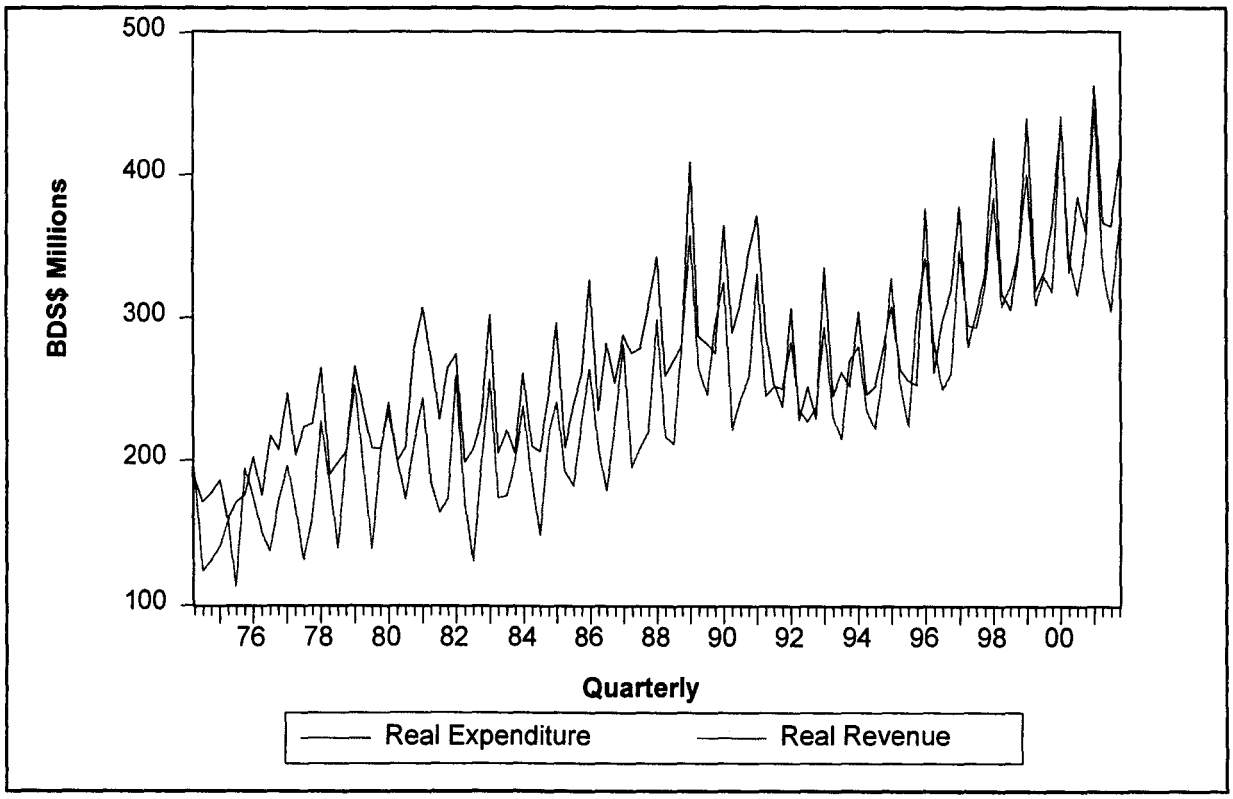


Table 2. Results of Tests for Stationarity

			Full Sample	1974:2–1979:4	1980:1–1990:4	1991:1–2001:4
RR	Level	ADF	-0.106	-1.548	0.198	0.487
		PP	-3.796**	-2.795*	-4.279***	-3.690***
		KPSS	1.112***	0.510**	0.699**	0.706**
		ERS	110.079	24.724	87.655	115.088
		$MZ_{\hat{a}}$	1.423	-2.835	-0.869	0.070
		$MZ_{\hat{t}}$	1.225	-1.183	-0.609	0.091
		MSB	0.862	0.417	-0.701	1.298
		MP_T	57.981	8.618	25.047	91.072
	Δ	ADF	-27.383***	-7.018***	-3.360***	-17.660***
		PP	-25.757***	-11.638***	-13.298***	-16.097***
		KPSS	0.075	0.189	0.141	0.132
		ERS	0.289***	2.955**	1.335***	2.113**
		$MZ_{\hat{a}}$	-17.021***	-8.387**	-71.602***	-15.211***
		$MZ_{\hat{t}}$	-2.822***	-2.047**	-5.983***	-2.750***
		MSB	0.166***	0.2441*	0.084***	0.181***
		MP_T	1.792**	2.923**	0.342***	1.641***
RG	Level	ADF	-0.067	-0.456	-0.283	0.156
		PP	-5.454***	-3.862***	-4.336***	-3.878***
		KPSS	1.021***	0.514**	0.774***	0.708***
		ERS	45.988	76.972	39.529	159.53
		$MZ_{\hat{a}}$	1.559	-0.172	0.719	0.070
		$MZ_{\hat{t}}$	1.041	-0.174	0.492	0.077
		MSB	0.668	1.009	0.684	1.105
		MP_T	38.417	54.226	34.362	67.834
RG	Δ	ADF	-2.651*	9.015***	11.372***	-14.604***
		PP	-37.678***	-10.468***	22.802***	-15.843***
		KPSS	0.076	0.248	0.224	0.398*
		ERS	2.963**	0.692***	1.459***	1.557***
		$MZ_{\hat{a}}$	-94.620***	-45.11***	-27.71***	-33.38***
		$MZ_{\hat{t}}$	-6.861***	-4.674***	-3.717***	-4.078***
		MSB	0.073***	0.104***	0.134***	0.122***
		MP_T	0.293***	0.736***	0.901***	0.757***

*, ** and *** are the critical values for rejection of the null hypothesis at the 10%, 5%, and 1% levels, respectively. Δ denotes the first difference of the original series. *ADF* is the Augmented Dickey-Fuller. *PP* is the Phillips-Perron, which, instead of adding differenced terms as explanatory variables to correct for higher order serial correlation as with the ADF, makes the correction on the t-statistic of the AR coefficient. Note that both the *ADF* and *PP* tests suffer from severe size distortions when there are negative-moving average errors. In lieu of this, we used the Elliot, Rothenberg, and Stock (*ERS)* Point Optimal test, which has improved power characteristics over the ADF test, and the Ng and Perron testing procedure (*NP*), which exhibits less size distortions compared to the PP test. The *NP* procedure involves four test statistics: MP_T, which calculates the ERS statistic for the GLS detrended data; the MZ_α and MZ_t, which modify the Z_α and Z_t statistics of Phillips and Perron; and the MSB modifies the Bhargava statistic). Since all the above tests take a unit root as the null hypothesis they have a high probability of falsely rejecting the null of non-stationarity when the data generation process is close to a stationary process; thus we also utilised the KPSS test where the null hypothesis is specified a stationary process.

Table 3. Results of Cointegrating VAR Regression

Estimated Cointegrating Relationship	
	$RG = -609.201 + 0.891RR$ [12.384]
ECT -0.557 (0.001)	
R^2	0.823
DW	1.939
SC	5.421(0.247)
RESET	2.671(0.102)
Norm	0.573(0.751)
HET	0.013(0.911)

Note that the cointegration rank test is more efficient if carried on a data congruent VAR and thus we begin by estimating an unrestricted VAR with a maximum lag length of 12. The three selection criteria employed (the Akaike information, Schwarz Bayesian and Hannan-Quinn) all suggested a lag length of 5. Further tests confirmed that the residuals of the VAR(5) model do not suffer from non-normality, serial correlation or heteroskedasticity. A misspecification test was also carried out. Having verified a data consistent VAR specification, we proceeded to check for a cointegrating relation among the variables. The results point to one cointegrating vector. To derive the long-run estimates, an exact identification in sequential order is imposed. Since there is only one cointegrating vector, this entails first normalising on RR, then checking the significance of the error correction-term in the two resulting dynamic equations, then repeating the process by normalising RG. This procedure indicates that the normalisation on RG produces an error-correction model in which the error-correcting term is significant only in the RG equation, while with the normalisation on RR the error-correcting term is insignificant in all both equations. Hence, we proceeded by normalising on RG to derive the results above. The F-statistic for the respective tests are shown (unless indicated otherwise) with the associated P-value in parentheses. T-statistics are in square brackets. *DW* is the Durbin-Watson statistic. *SC* is the Lagrange multiplier test of residual serial correlation (Chi-square of degree 1). *FF* is the Ramsey's RESET test for incorrect functional form using the square of the fitted values (Chi-square of degree 1). *Norm* is the test for normality of the residuals based on the Jarque-Bera test statistic (Chi-square of degree 1). *HET* is the Heteroskedasticity test based on the regression of squared residuals on squared fitted values.

sense to search for cointegration. The results of such analysis are presented in Table 3 along with some standard diagnostic test statistics for the error correction model. These results suggest that there exists a stable relationship between the two series with a coefficient of approximately 0.9. Also note that this relationship is defined with *RR* on the right-hand side, implying that it is one in which *RG* responds to dis-equilibrium (in statistical terms, *RR* is weakly exogenous in the cointegrating system). In other words, short-run deviations from the equilibrium relationship result in public expenditures adjusting to restore equilibrium, which is consistent with stylised facts (for example, the dramatic expenditure-cutting policies of 1991).

A plot[2] of the equilibrium relationship shows that it is quite stable and well defined, as the time profile of system-wide shocks indicates a rapid convergence to equilibrium. Hence, we can summarise that variables under examination are cointegrated and that the estimated coefficient for expenditure is highly significant and relatively close to one. Based on these two criteria it can be concluded that fiscal policy has been sustainable over the period.

We also examined the complementary definition: the NPG condition. The stationarity tests, when applied to the first difference of the real stock of public debt in Barbados (total, domestic and external) over the period 1960-2003 (this is annual data since a consistent quarterly series was not available), all suggested that the changes in real public debt follow a stationary process (Table 4). In other words, the solvency condition of Equation 2 is satisfied. This is an expected result, given that the test is really the mirror of the cointegration test of the Government accounts. In fact, Trehan and Walsh (1991) observed that the stationarity of the variation of the stock of public debt is a sufficient condition for the sustainability of the fiscal position.

Table 4
Stationarity Tests on Real Public Debt (1960-2003)

	Total	Domestic	External
ADF	-5.606***	-6.621***	-4.033***
PP	-5.593***	-6.621***	-3.992***
KPSS	0.238	0.460*	0.077
ERS	1.412***	1.391***	1.558
$MZ_{\hat{a}}$	19.986***	-20.855***	17.106***
$MZ_{\hat{t}}$	-3.156***	-3.229***	-2.907***
MSB	0.156***	0.155***	0.170***
MP_T	1.249***	1.176***	1.499***

2 Available from the authors upon request.

4. Related Issues

There are a number of other issues related to fiscal sustainability that are of paramount importance for policymakers and which are briefly explored in this section. In the first sub-section, our regression equation for the cointegration test under the PVBC approach is reformulated as a time varying coefficient (TVC) model, thus enhancing the explanatory power of the results and rendering them more useful for policy development. Secondly, sub-section 3 will take a brief look at the topical question of deficit-targeting, setting out a simple guide to assist policymakers in their decisions.

4.1 The Time Varying Coefficient (TVC) Model

The foregoing analysis of the intertemporal budget constraint under the PVBC approach assumed that the parameters were fixed over time. This has been cited as a drawback by some authors, including Abdulnasser (2002), who argued that parameters cannot be used for policy recommendations if the so-called Lucas critique is not taken into consideration. The Lucas (1976) critique of econometric policy evaluation is that macro-economic parameter estimates are not invariant under changes in policy regime and therefore such estimates are useless for forecasting the impact of the policy changes.

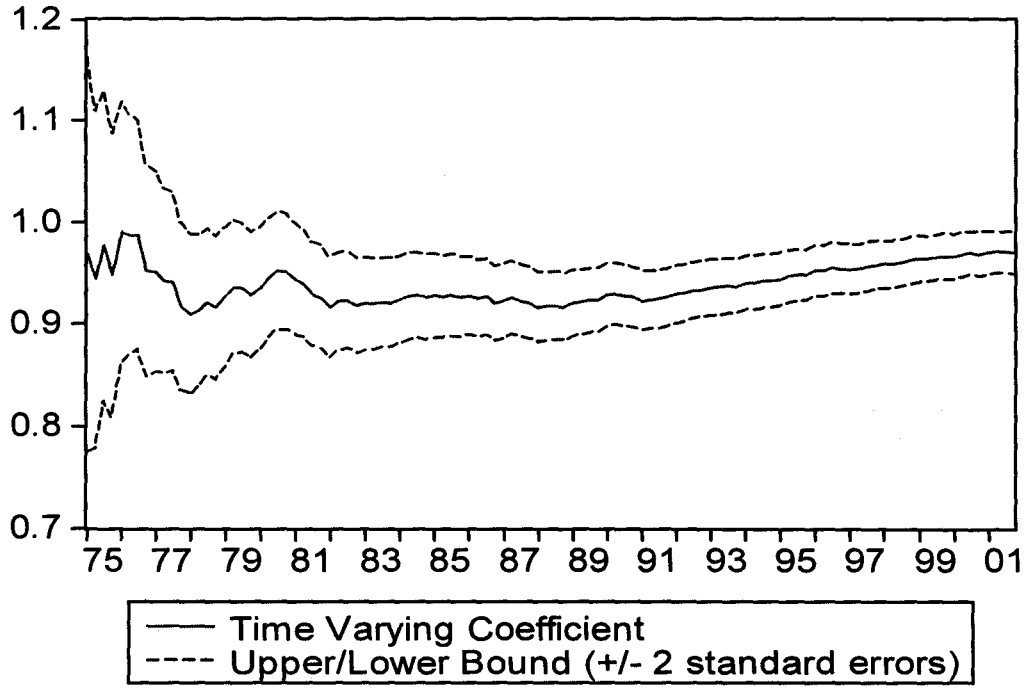
Allowing the parameters of the cointegrating equation to change over time yields:

$$R_t = \underset{(0.1382)}{-23.27} + \underset{(0.000)}{0.97}\, GG_t .$$

Here the numbers in paren-theses are the associated p-values. The results are similar to the fixed coefficient model, with the estimated coefficient for expenditure very close to one and highly significant. The residuals were tested for unit roots by conducting an ADF test and the results (a test value of –5.7773 versus a critical value of –3.4919 indicated that they were stationary at the 1% level of significance. This confirms that the two variables form a cointegrating relation.

One of the advantages of the TVC model is that it gives information about the β coefficient within the sample period. Figure 2 shows a time plot of the point value of β, as well as a band of two standard errors of the residuals. The graph shows that the estimated β remains relatively close to one; this provides further evidence that government has fulfilled its budget constraint during the sample period. There were some periods of volatility in the late 1970s and early 1980s and again around 1991 and 1992, but these were not persistent. Furthermore, since 1992 β has moved closer and closer to one. This implies that changes in the government deficit are followed by adjustments to future spending, which when discounted is equal to the original change in the present value of the government deficit.

Figure 2
Evolution of Time Varying Coefficient Over Time



4.2 The Optimal Size of the Fiscal Deficit

An in-depth investigation into the optimal size of the deficit is beyond the scope of this study and was not attempted here. Instead, the focus was solely on the sustainability of the fiscal position, irrespective of what it was or should have been. Nevertheless, it seems appropriate at this point to reflect briefly on this issue.

Although the literature is somewhat mute on the size of the fiscal deficit to GDP ratio, some simple accounting shows that the debt–GDP ratio evolves according to the formula: $d_t - d_{t-1} = -\left[\frac{\psi_t}{1+\psi_t}\right] d_t + def_t$, where d_t is the debt–GDP ratio at the end of period t; ψ_t is the growth rate of nominal GDP in period t (real growth plus inflation); and def_t is the deficit–GDP ratio in period t. Thus, nominal GDP growth reduces the debt-GDP ratio, but a larger deficit (relative to GDP) increases the debt-GDP ratio. If the debt–GDP ratio is constant we get: $d_t = [(1+\psi_t)/\psi_t]\, def_t$.

This equation can be used as a guide for determining the limit on the fiscal deficit. Its main implication is that in the long run a deficit guideline def^* and a debt guideline d^* can be mutually consistent only for one particular growth rate of nominal GDP.

Using long-run real GDP growth of 3% per annum plus a long-run inflation rate of 2.5% would imply 5.5% annual growth of nominal GDP. Taking the 2000 and 2001 debt-GDP ratios of 69.5% and 70.1% as sustainable (this has already been confirmed by the foregoing analysis), the equation gives a deficit-GDP ratio between 3% and 3.6% as compatible and hence sustainable. Therefore, this range would be suggested as optimum.

5. Conclusion

The findings of sustainability tests, under both the "accounting" and the "PVBC" approaches, indicate that fiscal policy since independence has in fact been sustainable. Even when the latter approach was evaluated within a time-varying coefficient model, results showed that the TVC remained close to one for the whole of the review period, providing further empirical support for the finding that Government has consistently adhered to its budget constraint.

The onus is therefore on policymakers to extend this favourable track record into the future, resisting the urge to rest on their laurels and working to ensure that future policy decisions continue in the tradition of prudent fiscal management that has been established. This will be all the more difficult to achieve in the face of the new challenges posed by the twin phenomena of globalisation and liberalisation: It will be necessary to balance the need for policies which can increase competitiveness and stimulate growth against the need to maintain fiscal discipline in order to preserve Barbados' good standing in the international financial community. In this regard, policymakers are urged to observe the guidelines set out above for the management of the fiscal deficit.

Finally, notwithstanding the somewhat narrow focus of this study, fiscal sustainability should not be contemplated in a vacuum, but rather it must be seen within the wider context of overall macroeconomic sustainability. To this end, policymakers must coordinate fiscal policy with other policy areas, so as to maintain an environment of low inflation and unemployment, exchange rate stability and external account equilibrium, as well as fiscal sustainability.

References

Abdulnasser, H. 2002. "Is the Government's Intertemporal Budget Constraint Fulfilled in Sweden? An Application of the Kalman Filter", *Applied Economics Letters*, Vol. 9, No. 7, pp.433-439.

Blanchard O-J, 1990. "Suggestions for a New Set of Fiscal Indicators", OECD Working Paper No. 79, (April).

Buiter, W; G. Corsetti and N. Roubini. 1993. "Excessive Deficits: Sense and Nonsense in the Treaty of Maastricht", *Economic Policy: A European Forum*, No. 16, pp. 57-100.

Hakkio, C.S. & M. Rush. 1991. "Is the Budget Deficit 'Too Large'?" *Economic Inquiry*, Vol. 29, No. 3, pp. 429-445.

Haynes, C. and C. Holder. 1987. "Monetary and Fiscal Policy in Barbados 1970-85", Central Bank of Barbados Working Papers, pp. 43-45.

Howard, M. 1989. "Public Sector Finance" Chapter 11, *Dependence and Development in Barbados, 1945-1985*, Carib Research and Publications Inc., Bridgetown, pp. 115-128.

International Monetary Fund. 2002. "Assessing Sustainability", available at http://www.imf.org/external/np/pdr/sus/2002/eng/052802.htm

Lucas, R. E. 1976. "Econometric Policy Evaluation: A Critique", *Carnegie-Rochester Series on Public Policy*, No. 1, pp. 19-46 .

Mankiw, N. G. 2000. *Macroeconomics*, Worth Publishers, New York, pp. 400-401.

24

The Implications of Privatisation for the Eastern Caribbean Countries

Patricia Welsh-Haynes

Abstract

Historically, the colonial government's contribution to the development of the Eastern Caribbean countries has not been extensive. In more recent times, government's role has been challenged, primarily because of the deteriorating financial situation of some state-owned enterprises. The paper analyses the institutions within the Eastern Caribbean that have undergone the transition from a fully or partly-owned public enterprise to some form of privatisation. In addition, the experiences in Jamaica and Trinidad are compared with that of the Eastern Caribbean and point to the constraints that small economies can face in their efforts to privatise state-owned enterprises.

Introduction

For some time now the concept of privatisation has been increasingly emphasised on the economic and political agenda of the governments of the Eastern Caribbean countries. The debate surrounding privatisation is based on limited empirical evidence and is often grounded in a questionable analytic framework (Adam, Cavendish and Mistry, 1992). Despite this, privatisation has won the favour of some governments, and the international financial institutions - the World Bank and International Monetary Fund (IMF) - have embraced it. The philosophy of privatisation explicitly accepts that the private sector is superior to the public sector in the provision of goods and services. For many, this belief has become almost axiomatic. According to Nankani (1990), the record of those nations that have undertaken privatisation programmes during the 1980s is mixed. And even for the more successful cases, no clear blueprint for success emerges. Each instance of privatisation seems to have its own history and dynamics, suggesting the need to adopt a case-by case approach rather than

try to formulate a general model. Therefore, only through a detailed evaluation of the fundamentals and practices of privatisation as it pertains to the Eastern Caribbean countries can a better understanding of the process be achieved.

In this paper privatisation will be examined from an economic standpoint. Central to the approach is a careful evaluation of the theoretical underpinnings, which to a large extent determined the role of the government and the role of the private sector in the development of the countries of the Eastern Caribbean. The paper then examines the reasons why at different points in time, both the private sector and the public sector failed to contribute significantly to the process of economic development. Additionally, the paper attempts to define privatisation, its objectives and the different forms by which this process can be achieved. Finally, it reports on a survey based on in-depth interviews in the countries of the Eastern Caribbean that have undergone the transition from fully owned public enterprises to some form of privatisation and the impact the divesture has had on the entities and the economy as a whole.

The Role of the Government in the Eastern Caribbean Countries

The responsibilities bestowed upon the governments of the Eastern Caribbean have their beginnings in the colonial era and the collapse of the plantation system. After the collapse of the plantation system, many of the islands suffered in different degrees from poor housing and health conditions, inadequate provision of utilities such as water, electricity and communications. Educational facilities were insufficient and the road and transportation network left much to be desired. The Moyne Commission, reporting in the early part of this century, pointed to the deplorable conditions which the large majority of the population faced. This prompted the British Government to undertake, through its colonial administration, a number of social reforms including improvements in education, health, housing and a number of public amenities. These responsibilities were adopted as the people of these countries moved to self-governance. According to the 1996 study by RIPA International, the transition from colonial administration to self-government and finally to political independence heightened the consciousness of community leaders about the social responsibility of government to provide basic services to a highly dependent population. Additionally, there was a profound wish to move toward the welfare state form of capitalism, a philosophy which is bound up in the West Indies with the fact that, in the past, exploitation of class was also exploitation of the majority race by the minority. Nationalism and welfare politics were closely linked (O'Loughlin, 1968). Therefore, there existed an added consciousness among the leaders to provide a more even distribution of wealth for the masses.

Governments in the islands were seen as the only social partner to provide and undertake these great responsibilities as the collapse of the plantation economy left an extremely weak, vulnerable and unorganised private sector dependent on protected markets, import trading and various forms of government largesse. The region did not have the advantage of significant industrial progress (as in many other countries) before entering into a fully democratic and liberal

system of self-governance. Therefore, throughout the region governments had to assume a role much beyond that of regulator and facilitator, to the point where their influence dominates every aspect of social and economic life.

Definition of Privatisation and its Objectives

Privatisation is a process of asset divesture where ownership, either fully or in part, is shifted from government-owned enterprises to the private sector. It is an instrument geared towards both short-term stabilisation through expenditure reduction and also medium term supply-side improvement by promoting more efficient resource allocation (Adam, Cavendish and Mistry, 1992). With this in mind it is important to examine the number of objectives privatisation seeks to achieve.

First, privatisation allows for gains in productive efficiency that pertain to the notorious "x-inefficiencies" for which public enterprises are well known. The argument here is that public enterprises tend to misuse production inputs because they are protected from competition, enjoy privileged access to subsidised capital and often have social welfare objectives or non-commercial functions such as employment creation or income redistribution. Management performance is not subjected to the regular scrutiny of shareholders, so there is no incentive to maximise profits and minimise costs (Brown and Ryan, 1992). In many cases, public enterprises experience problems like over-staffing, low worker productivity and incompetent management. These problems are perpetuated by government's ability to intervene in the affairs of the enterprise and use it for non- economic ends.[1]

The second major area which privatisation is expected to impact on the reduction of the financial burden of the government. In the early to mid 1980s governments of the Eastern Caribbean received large amounts of concessional aid to fund their public sector investment programme. The data revealed that for most of the countries in the study there was a marked deterioration in the current account from as early as 1981, making it even more difficult for government to provide counterpart funding for capital projects. At the end of the 1980s governments saw a drastic reduction in such aid flows. A government's commitment to provide adequate resources for a large number of public sector projects to ensure continued economic growth imposed a heavy burden on its financial resources, since more funds had to come from the current account to finance the public sector investment projects. The rapid growth of government expenditure for some of the countries far exceeded the growth in revenue, resulting in a widening of the resource gap. This development prompted the governments to find new approaches to relieve the financial burden. Privatisation

---

1 Non-economic ends are viewed as objectives that are inconsistent with the efficient and financially viable performance of an enterprise. Some examples of these are employment maximization, non-competitive price setting aimed at keeping input prices low for other sectors and uneconomic investments.

was considered to be one of the most effective ways of doing so. It must be noted that whilst the immediate effect of an asset sale is indeed a reduction in the current budget deficit, it is a short-term correction measure. If governments invested money in making enterprises viable, and ensured that the new measures were sustainable, the benefits to be derived from the future earnings stream of the enterprises would more than offset the debt incurred to make the enterprises profitable. If governments were to privatise the enterprise and invest the proceeds in income-earning assets, and if capital markets are efficient, then the net earnings from investing the proceeds from the asset sale in, say, bonds, would generate a profit stream of equal net present value (Adam, Cavendish and Mistry, 1992).

The third major benefit of privatisation is the ability to stimulate private sector growth and activity, promote economic democracy by broadening participation in the ownership of national assets and develop a spirit of entrepreneurship. It spells a renewed commitment to the magic of the market (Brown and Ryan, 1992). This is an intriguing argument when it is noted that in the countries of the Eastern Caribbean, public enterprises were established in the first place because the private sector was weak and unwilling to make large investments carrying a high degree of risk. However, in developing countries privatisation is seen as an instrument to "crowd-in" a nascent private sector, and thus reverse the downward trend in aggregate private sector investment which has been such a characteristic of the 1980s. It is viewed, therefore, as a means not only of enhancing the marginal efficiency of existing investment (by switching its sources of supply), but as a means of increasing the total volume of investment.

Closely tied to the objective of stimulating private sector growth is the view that privatisation, especially in the countries of the Eastern Caribbean, will be the vehicle through which local capital markets may be developed and domestic savings enhanced. For many of the islands, the problem is the absence or shortage of tradable stock. It is felt that the sale of government equity will be the ideal starting point for the capital market development. However, given the size of the islands, privatisation and capital market development will be more successful if it is done on a large scale. In light of this, the Eastern Caribbean Central Bank has developed a securities market (ECSE) for member countries, which seeks to improve the quality of government debt management and to reduce fragmentation in the government securities market. More pertinent to the study is capital market development. In creating this market it is important to take into consideration the ability of the market to mobilise savings for investment and at the same time provide price signals to enhance resource allocation.

Analysis of Country Case Studies in the Eastern Caribbean Studies

Privatisation rose to prominence in the late 1970s and 1980s with the coming to office of strong right wing governments in the United Kingdom and the United States (Lewis, 1990). Under leaders like Margaret Thatcher of Great Britain and Ronald Reagan of the United States, privatisation took shape as a process of shifting ownership from government-owned businesses to the private sector. Countries like the US and the UK fostered this alternative in an effort to eliminate

the financial strain on governments, which had to maintain their enterprises at the expense of public funds. Once this burden was lifted the proponents of privatisation could focus now on the more profitable venture of restructuring the economies to cater to international markets. According to Lewis (1990), the inception of privatisation in the region was largely the result of influence on the part of advanced industrial countries. In his essay, he states: "Convinced of the soundness of their actions the advanced industrialised countries have used their influence to make privatisation a condition of further financial assistance to peripheral capitalist countries in the Caribbean, Africa and Latin America."

Lewis' analysis seems to suggest that for countries like Jamaica and Trinidad and Tobago the process of privatisation was influenced by the deteriorating state of the economy and a shift of economic policy as a result of a change of government in 1980 for Jamaica and 1986 for Trinidad and Tobago. However, the catalyst behind the privatisation process for both countries was their decision to undergo a structural adjustment programme with the international lending institutions. Embodied as a policy conditionality in the reform programme was the general restructuring of state-owned enterprises (SOEs) with a view to privatisation.

In the ECCU, the process of privatisation was not entirely influenced by the same factors as those for Jamaica and Trinidad. Of the seven countries that were surveyed, only Grenada and Dominica stated that the privatisation effort was part of a home-grown structural reform on the part of the policy authorities. Although the privatisation effort in Grenada and Dominica was not part of a structural adjustment programme with the international monetary authorities, as was the case for Jamaica and Trinidad, it had been recommended on numerous occasions. In an effort to reverse the deteriorating state of the public finances, the authorities decided to undergo their own reform.

Grenada's structural adjustment programme was designed with assistance from the Caribbean Development Bank (CDB), the University of the West Indies (UWI) and the OECS Economic Affairs Secretariat. The goal of the programme was to improve government finances. To achieve this goal, the programme focused on fiscal reform, privatising state-owned enterprises, rationalising employment in the Civil Service and reducing arrears of debt and contributions.

Dominica considered accessing funds through the IMF's Enhanced Structural Adjustment Facility. Therefore, an economic adjustment programme was designed. The main areas of focus for the programme were public sector reform, tax reform, fiscal administration, trade liberalisation and trade and exchange liberalisation. Of the many focus areas, public sector enterprise reform included the privatisation of several enterprises, including the Dominica Electricity Services.

In 1998, a total of 13 public enterprises were surveyed within the countries of the ECCB, with the exception of Antigua. Of the 24 respondents, 46.2 per cent stated that the effort to privatise was part of a structural reform programme, with the majority of companies from Grenada. The privatisation programme in Grenada was the largest of all the countries surveyed, with 5 public enterprises privatised during the period 1985 to 1997. For the other countries combined, 53.8 per cent reported that the privatisation effort was an isolated event and for Anguilla and St. Kitts and Nevis two enterprises were privatised in each territory. In the case of Montserrat, St. Vincent and the Grenadines and St. Lucia only one

public sector firm was privatised during the period 1985 to 1997 (see Table 1 and Appendices).

For Anguilla, the decision to privatise the solid waste collection and disposal services and the electricity services was largely influenced by a number of problems which plagued the delivery and management of both services. Prior to 1989, the Public Works department was responsible for the collection and removal of solid waste. However, the frequent breakdown of waste disposal vehicles and high maintenance costs led to infrequency in the collection of waste matter. In order to maintain the natural beauty of the island and to mitigate the health risks the government decided to privatise the operation of waste disposal. After a negotiation period of about two years, the government awarded a lease and management contract to two private companies in 1989. In the case of the electricity services, prior to 1991, there was a large number of outstanding bills, coupled with a high degree of equipment failures and outages. The Government sought help from the Commonwealth Development Corporation (CDC) and in 1991, privatised the electricity services by offering a private sale of shares and management contract to CDC.

Based on discussions with the public sector and private sector officials, it was ascertained that there was an improvement in the delivery of services after both operations were privatised. Solid waste was picked up more frequently, leaving less piles of waste on the street. The services provided by the Anguilla Electricity Co. were more reliable and a more effective collection procedure was introduced. In addition, there were less frequent outages and the company put together a better maintenance programme by increasing the capital works and adding additional equipment. As a result of the privatisation effort, the government met its two objectives of efficiency and debt reduction.

In St. Kitts and Nevis the privatisation effort started as early as 1985 with the privatisation of the tele-communication services. This was done in an effort to improve the telecommunication services between St. Kitts and Nevis and the rest of the world. Within the agreement the government gave St. Kitts and Nevis Telecommunications Co Ltd. (SKANTEL) full control over the telecommunications

Table 1
Number of Privatisations by Country and by Function of Enterprise

	Total	Tele-Communi-cation	Electri-city	Waste Disposal	Manu-facturing	Broad-Casting	Banking
Anguilla	2		1	1			
Dominica	1		1				
Grenada	5	1	1		1		2
St Lucia	1		1				
Montserrat	1			1			
St Kitts and Nevis	2	1				1	
St Vincent &The Grenadines	1				1		
TOTAL	**13**	**2**	**4**	**2**	**2**	**1**	**2**

Source: Based on the1998 survey responses.

services until the year 2015. The new company was also exempted from the payment of withholding tax and all imported vehicles, equipment and related material were exempted from customs and other import dues and stamp duty. The new company was responsible for the telecommunications services within St. Kitts and Nevis and was to provide, install, maintain, operate and augment the international telecommunications services between St. Kitts and Nevis and places or mobile stations within or outside St. Kitts and Nevis.

Discussions with both the public and private sector officials revealed that the privatisation was beneficial to all parties involved and achieved four broad objectives - efficiency, revenue enhancement, broader ownership and investment. SKANTEL replaced the existing analog system with the Eastern Caribbean Microwave System. Subsequently, the local system was further improved with the laying of fibre optic trunk lines and the installation of new digital exchanges. As a result, the citizens of St. Kitts and Nevis enjoyed direct-dial world-wide access.

The privatisation of the broadcasting station (ZIZ) came about 12 years later with a management contract awarded to Caribbean Communications Network Limited (CCN). The agreement was that CCN would enter into a management contract for three years and would work towards the rehabilitation of ZIZ's production facilities and the general rationalisation of the current radio and television organisations. CCN was also expected to turn the company into a profitable venture. At the time of research for this paper the company was relatively new, therefore the officials agreed that it was too early to determine whether or not the objectives of privatisation were achieved.

In Montserrat, the privatisation of the solid waste collection services was somewhat similar to that of Anguilla, although the problems were not as pronounced. Prior to 1995, the collection and disposal of solid waste was plagued with problems. A study by the Ministry of Health resulted in a proposal to privatise the services. In 1995, the Executive Council agreed to contract out the provision of waste disposal and collection services to two private entities. The survey results revealed that the objectives met, as a result of the privatisation were efficiency and competition. In St. Vincent and the Grenadines there is no explicit privatisation policy, therefore the decision to privatise St. Vincent Distillers in 1996 was an isolated event. St. Vincent Distillers had accumulated a large debt with the Caribbean Development Bank. The situation was not sustainable and it posed a serious threat to the maintenance of government savings. Government agreed to privatise the company by selling 99.0 per cent of its shares to a private company. The proceeds of the sale were used to offset the debt. Privatisation met government's objectives to reduce debt and attract investment. The new company improved its management and administrative skills, enhanced the training and skills of its employees and replaced capital equipment. As a result of positive returns and increasing demand for its products, the company is planning to manufacture a new rum.

Legislation passed in 1994 provided the opportunity for St. Lucia Electricity Services Limited (LUCELEC) to operate as a private business. The company operates under an exclusive statutory licence, which expires in 2045, for the exercise and performance of functions relating to the supply of electricity in St.

Lucia. In 1994, LUCELEC offered 3,300,000 ordinary voting shares at $10.00 per share. After the issue, the shareholding was as follows, CDC (44.9 per cent), the Castries City Council (16.6 per cent), Government of St. Lucia (12.4 per cent), National Insurance Scheme (12.5 per cent) and the public (13.6 per cent). The level of profitability has increased from 1995 to 1998 and the officials are confident that this trend will continue.

Of the 13 officials surveyed, 11 responded to the question "Was the enterprise generating a profit or surplus before privatisation?" Of the five companies making a profit prior to privatisation, four were utility enterprises. Three of the five enterprises that were making a profit before privatisation were telecommunications enterprises. Six of the companies were not profitable and this was evident for the manufacturing and broadcasting corporations, the national banks and two of the six utility enterprises.

All of these companies attracted foreign private investors, adding to the region's stock of FDI. It might be argued that the foreign investors were attracted to these enterprises for reasons other than profit. Although there may be some element of truth in the argument, it does not take away from the fact that a profitable company is by far more attractive to investors than one that is unprofitable. Therefore, it can be argued that in an effort to privatise unprofitable enterprises, government will be forced to compromise its position. Nine of the 13 public sector officials responded to the question "Did the government receive a fair deal for the privatisation effort?" Although there was consensus that government received a fair deal the majority of respondents stated a number of things that could have been done differently. Most of the responses were in reference to the telecommunications companies. The officials stated that more time should have been taken in negotiating the agreement. It was felt that due to the urgency with which government needed the financial resources, the ability to better negotiate was lost. In addition, the granting of exclusive rights to offer telecommunication services should have been for a shorter period and possibly should not have entailed the wide range of services the contract covered. For the waste disposal companies, waste disposal officials said that the contract should have included street cleaning.

The analysis and discussions with the officials also revealed that most of the enterprises operated in an inefficient manner. This finding was more prevalent in the electricity, solid waste and banking enterprises. For the four electricity enterprises, the major problems stated were frequent outages, equipment failure and unreliable service. In the area of solid waste collection, the public works department reported many problems, such as extremely high maintenance costs due to constant breakdowns, infrequency of collection and inadequate number of garbage collection vehicles. For the two banking enterprises, the major problem stated was the increasingly large delinquency portfolio.

The decision to privatise these enterprises depended on the governments' overall fiscal and development policy and their financial position. Of the 13 government officials that responded, six stated that the decision to privatise was part of a general structural reform on the part of the policy authorities. Additionally, the analysis revealed that of the eight objectives that were met by the privatisation effort (see Appendices), the maximising of revenue and achieving

efficiency recorded the highest percentages of 53.8 per cent. The objectives to achieve a more competitive environment and access foreign exchange recorded the lowest percentages of 7.7 per cent. The development of capital markets was not chosen as an objective of the privatisation effort.

The study sought to draw a linkage between the type of enterprise and the eight stated objectives. For the utility companies, maximising revenue was the objective with the highest frequency. Five of the six officials selected this objective. The other objectives with the exception of the "the development of capital markets" were split equally as 50.0 per cent of the officials listed attracting investment, efficiency, reducing the debt and broadening the ownership as the other objectives that were met. The remaining 50.0 per cent did not feel that these objectives were met as a result of the privatisation effort. For the two manufacturing companies the only objectives met were reducing the debt and attracting investment. For the national banks and the waste disposal companies efficiency was the objective which recorded the highest frequency. The other objectives that were met were maximisation of revenue, reduction of debt and broadening of ownership. In respect of the broadcasting company, the objective that was met as a result of the privatisation effort was that of efficiency.

Of the six stated methods of privatisation, only the sale of equity, lease and management contract and contracting out goods and services were used by the countries within the study. Contracting out the provision of services and lease and management contract took a shorter time to implement than the sale of equity as both methods were completed within 3 to 12 months. In the case of the sale of equity, with the exception of the public offering of shares by the St. Lucia Electricity Services Ltd. which took less than 12 months to be implemented, the privatisation process lasted more than a year. This is not surprising as undertaking a public or private offering of shares takes time to implement, for example, notification of offer, preparation of application forms, etc.

The privatisation process for the seven countries within the study is a relatively new one. Between 1985 and 1997, of the 13 public operations that have been privatised, 8 per cent of the privatised took place between 1994 and 1997 and included all types of public enterprises within the study. However, for the period 1985 to 1993, seven of the enterprises that were privatised were utility enterprises. The methods of privatisation used were the sale of equity, lease and management contract and contracting out the provision of services. The method which was most widely utilised was sale of equity, as 10 per cent of the privatisation was done through a sale of shares. The sale of shares is one of the best ways for government to increase its revenue intake and the inflows of foreign investment. It is no surprise that of the eight objectives, the four which recorded the highest frequency were to maximise revenue (53.8 percent), efficiency (53.8 per cent), reduction of debt (38.5 per cent) and attract revenue (30.8 per cent).

Telecommunications in St. Kitts and Nevis – A Case Study

The privatisation of the telecommunications services in St. Kitts and Nevis has been the first in all countries in the study and therefore offers an interesting opportunity to explore the telecommunication sector before and after privatisation.

A Historical Perspective of the Telecommunication Services in St Kitts and Nevis

Telegraphic communication first came to St. Kitts and Nevis in the early 1870s with the laying of a cable chain by the West India and Panama Telegraph Company Limited. This cable provided links to the islands of the Eastern Caribbean from St. Thomas in the north to Trinidad in the south. Cable communication between St. Kitts and the rest of the world continued until 1925 when the first wireless telegraphy link was established, under the supervision of the British Post Office, as part of the Pacific Cable Board's West Indian System. By 1932, the cable and wireless system operators had become part of the Cable and Wireless Group. The West India and Panama Telegraph Company Ltd which changed its name to Cable and Wireless (West Indies) Ltd., (CWWI) assumed control of all existing inter-national communications systems in the Federation of St. Kitts and Nevis in 1985.

In the 1950s and early 1960s, CWWI introduced VHF and UHF radio equipment to St. Kitts and Nevis, thereby increasing the efficiency of its international telephone and telegraph service. Links were established to Antigua and Montserrat via VHF radio and to St Maarten via UHF radio. In the latter part of the 1960s and 1970s further improvements to the international service were seen with the commissioning of an analog microwave link to Antigua. This 300 channel link gave St. Kitts and Nevis access to the Analog Eastern Caribbean Microwave System, which connected the islands of the Caribbean to the continental USA. The international telecommunications operation in St. Kitts and Nevis ran as a branch of CWWI until 1985. The national telecommunication system (operated by the Government of St. Kitts and Nevis) covered only Basseterre and the immediate rural areas in the early 1960s. The system was expanded in 1969 and again in 1980 to satisfy the great demand for telephone service in other rural areas and Nevis. At that time (1969 – 1980), revenue generated from the provision of telecommunication services averaged approximately $399,623.00, while total expenditure (including current and capital expenditure) averaged approximately $322,197.00. An overall profit of $77,426.00 was realised. The average number of employees was 24 and the number of lines connected at the end of 1980 was approximately 1700. From the period 1981 to 1984, the telecommunication sector continued to realise a small profit.

On July 2, 1985, the telecommunication sector was privatised and St. Kitts and Nevis Telecommunications Limited (SKANTEL) was incorporated, and acquired the assets of the CWWI. As a result of the privatisation, SKANTEL owned 80.0 per cent of the company, while the government of St Kitts and Nevis owned 20.0 per cent. In July 1989, SKANTEL made a bonus issue of 3.3 million shares and in December 1990, an offer for public subscription in SKANTEL of 3,323,077 shares was made. At the date of the final closing of the offer a total of 2,023,700 shares had been applied for and in May 1991 the Board of Directors of SKANTEL allotted in full the 2,023,700 shares. Further to the public subscription, under the terms of an agreement between CWWI and Government dated December 1, 1990, 138,461 shares were issued to the Government. As a result, the shareholdings in the company were CWWI 12,000,000 shares (70.0 per cent), Government of St. Kitts

and Nevis 3,138,461 shares (18.0 per cent) and the public 2,023,700 shares (12.0 per cent). On January 4, 1993 SKANTEL made an offer of 1,299,400 shares at a price of $2.00 per share. Upon full subscription of the issue, the new shareholdings in the company were CWWI 65.0 per cent, Government of St. Kitts and Nevis (17.0 per cent) and the public (18.0 per cent).

Growth in the telecommunication sector after privatisation in 1985 has been phenomenal. From 1986 to 1998, the rate of growth in revenue has been substantial. Revenue was $73.0 million in 1998 from $3.5 million in 1986. The high level of growth has been attributable to the improvements in the delivery of telecommunication services and a high increase in the number of new customers to 17,181 in 1998 from 2,200 in 1986. Total expenditure moved from $2.7 million in 1986 to $52.1 million in 1998. The growth in expenditure is evidence of the huge capital outlay undertaken by SKANTEL over the period under review. At the end of 1998, SKANTEL realised a profit of $20.9 million, compared with a profit of $0.8 million in 1986. Consistent with the growth in telecommunications services, the number of employees more than tripled to 191 at the end of 1998.

St. Kitts and Nevis is a small open economy with heavy reliance on trade. The substantial growth in telecommunications has had a positive impact on the economy, providing the impetus for trade by generating access to regional and international markets and thereby sustaining growth in the wholesale and retail sector.

Conclusion

The privatisation effort in the Eastern Caribbean has been influenced by many different factors. For most of the countries, the privatisation process was an isolated event; most of the countries did not have an explicit privatisation policy. A number of SOEs are targeted for privatisation over the medium and long term (see Appendices). The issue regarding the formulation of a privatisation policy is extremely important. The problems experienced by most of the countries that initiated the privitisation process could have been mitigated if these countries had in place a specific policy regarding the privatisation of SOEs. In its efforts to restructure and privatise a number of SOEs in St. Lucia, the government outlined in its 1998/99 budget statement a policy decision in reference to privatisation. It is hoped that the other countries would endeavour to follow the path which St. Lucia has taken, as it is a step in the right direction.

The privatisation programme in the Eastern Caribbean demonstrates that the constraints to privatisation are also tied to the economic structures of small developing countries. The first of these constraints speaks to the length of time it takes for the privatisation process to be implemented. For most of the enterprises, the privatisation process lasted between 12 and 24 months, as government sought to redraft legislation and correct a number of administrative bottlenecks. Second, the process was built around the small absorptive capacities of economies of each country. Sales or small contracts were given to domestic entrepreneurs, whereas the privatisation of utilities which involved extensive capital outlays was achieved by a public issue of shares and or foreign participation.

It is clear that the privatisation process in the Eastern Caribbean seems to have met the objectives laid out by the authorities. Its success will ultimately be

judged by the net contribution to the welfare of all with regard to the performance and efficiency of the companies. In addition the privatisation effort was deemed to be more successful when it formed part of a general structural reform programme.

References

Adam, C., Cavendish W. and Mistry, P.S. (1992) *Adjusting Privatisation.* Villiers Publication, London .

Brown, D. And Ryan S. (1992) *Issues and Problems in Caribbean Public Administration.* Multimedia Production Centre, Trinidad and Tobago.

Lewis, Linden. "Privatisation in the Caribbean: A Response to Global Restructuring" Paper presented to the Caribbean Studies Association XVth Annual Conference Port-of Spain, Trinidad: May 22-26, 1990. pp.13-15.

Nankani, H.B. 1990. "Lessons of privatisation in Developing Countries" Finance and Development, International Monetary Fund and World Bank Quarterly Publication. March 1990, Vol 9, Washington DC.

O'Loughlin, C. 1968. *Economic and Political Change in the Leeward and Windward Islands.* The Colonial Press Inc., Massachusetts.

RIPA International Management Consultancy and Training (March 1996). "Public Sector Management and Reform in OECS Countries" (Final Report - Working Draft).

Appendices

Appendix 1
State Owned Enterprises Targeted for Privatisation After 1997

Territory	SOEs Targeted for Privatisation
Anguilla	Water Services, Health Services and Ports
Antigua and Barbuda	N/A
Dominica	Dominica Water and Sewerage Company (DOWASCO)
Grenada	Postal Services, Health Services, Government Printery and Grenada Electricity Services
Montserrat	School Bussing, Quarry and Radio Montserrat
St. Kitts and Nevis	St Kitts Sugar Manufacturing Corporation (SSMC), Quarry and Electricity Department
St. Lucia	St Lucia Marketing Board, St Lucia Banana Growers Association and The National Commercial Bank
St. Vincent and The Grenadines	Water and Sewerage Authority

Appendix 2
Privatisation of State Owned Enterprises Between 1998 - 2002

Territory	SOEs That Were Privatised
Grenada	National Commercial Bank of Grenada, Postal Services, Health Services, Grenada Bank of Commerce, Grenada Electricity Company (GRENLEC), T.A. Marryshow Community College (TAMCC) and the Collection and Disposal of Solid Waste
Nevis	Nevis Electricity Department
St. Lucia	National Commercial Bank

Appendix 3
Survey for Private Institution

PURPOSE

This questionnaire is intended to evaluate and examine the institutions which have been privatised in the countries of the Eastern Caribbean.

NOTE

Please respond by circling a category for each question or writing your response on the line(s) provided.

1. What type of institution?

   a) Utilities Corporation
   b) Broadcasting Corporation
   c) Manufacturing Corporation
   d) Agricultural Corporation
   e) Transportation
   f) Other_____

2. How long has your institution been in the private sector?

   a) 0 - 5 yrs b) 6 - 10 yrs
   c) 11 - 15 yrs d) 16 - 20 yrs
   e) 21 - 25 yrs

3. In what year was your institution bought? _____

4. What method of purchase was used? (See notes at back for description of methods)

   a) Sale of equity
   b) Sale of Assets
   c) Lease of Assets
   d) Lease and Management Contract
   e) Build- Operate and Transfer
   f) Franchising or contracting out the provision of certain goods and services
   g) Other _____

5. If the method used was the sale of equity, what percentage of the shares were transferred? _____
   _____

6. If the method used was the sale of assets, what was the value of the assets sold?
   _____
   _____

7. If the method used was the lease of assets, what is/was the length of the lease period and what was/is the monthly payments?

8. If the method used was one of a management contract, what fees were charged in order to manage the entity and did it involve a transfer of personnel?

9. If the method used was one of Build-Operate and Transfer, what was the cost of constructing the new project and how long was the concession period before the project was transferred to government?

10. Kindly indicate if there were any other methods used besides the ones stated above

11. How long was the implementation of the privatisation process?

    a) 3 - 9 months
    b) 12 months
    c) 18 months
    d) 24 months
    e) greater than 24 months

12. What method was used to evaluate the institution before it was privatised?

13. How was this done?

14. What were the reasons why the implementation period took that duration of time?

15. What is the total wage bill?

16. What is the staff complement?

17. Is the company currently generating a profit?

Appendix 4
Methods of Privatisation

1. ***Sale of Equity***: This method of privatisation refers to the transfer of equity. This is usually done by the sale of shares. The government decides on the percentage of shares which they are willing to issue. The issue can be in the form of public offering of shares or private sale of shares.

2. ***Sale of Assets***: This method of privatisation refers to the sale of a public enterprise's assets to a private corporation. For example, this may involve the sale of a quarry or a public bus service.

3. ***Lease of Assets***: This method involves the transfer of rights to use assets for a specified period of time in return for specified payments.

4. ***Management Contract***: This method of privatisation involves contracting of private sector management expertise to manage a government entity for a specified fee. It entails the transfer of management responsibility and generally may not involve the transfer of personnel.

5. ***Build-Operate and Transfer***: This privatisation method involves the private sector constructing a facility using its own funds, operating the facility for a concession period and later on transferring it to government.

6. ***Franchising or Contracting out the Provision of Certain Goods and Services***: This involves a government decision to relinquish its responsibility to provide certain goods and services to the public and to transfer that responsibility to the private sector.

Appendix 5
Survey for Government Official

PURPOSE

This questionnaire is intended to evaluate and examine the public enterprises which have been privatised in the countries of the Eastern Caribbean.

NOTE

Please respond by circling a category for each question or writing your response on the line(s) provided.

1. What type of public enterprise was privatised?

    a) Utilities Corporation
    b) Broadcasting Corporation
    c) Manufacturing Corporation
    d) Agricultural Corporation
    e) Transportation
    f) Other_____

2. How long has the enterprise been privatised?

    a) 0 - 5 yrs
    b) 6 - 10 yrs
    c) 11 - 15 yrs
    d) 16 - 20 yrs
    e) 21 - 25 yrs

3. In what year was the enterprise privatised? _____

4. What method of privatisation was used? (See notes at back for description of methods)

    a) Sale of equity
    b) Sale of Assets
    c) Lease of Assets
    d) Lease and Management Contract
    e) Build- Operate and Transfer
    f) Franchising or contracting out the provision of certain goods and services
    g) Other _____

5. If the method used was the sale of equity, what percentage of the shares was transferred?

    _____

6. Were any of the shares issued to the general public?

    a) Yes b) No

7. If the answer is yes, what percentage of the shares was issued to the general public?

8. If the answer is no, what was the reason why a percentage of the issue was not offered to the public?

9. If the method used was the sale of assets, what was the value of the assets sold?

10. If the method used was the lease of assets, what is/was the length of the lease period and what were/are the monthly payments?

11. If the method used was one of a management contract, what fees were charged in order to manage the entity and did it involve a transfer of personnel?

12. If the method used was one of Build-Operate and Transfer, what was the cost of constructing the new project and how long is the concession period before the project is transferred to government?

13. Kindly indicate if there were any other methods used besides the ones stated above.

14. Listed below are eight (8) objectives of privatisation dependent on the method of privatisation used. Please indicate if any of the objectives were met by the privatisation effort.

    1) Efficiency
    2) Competition
    3) Broaden Ownership
    4) Maximise Revenue
    5) Reduce Debt
    6) Attract Investment
    7) Develop Capital Market
    8) Access Foreign Exchange
    9) Other

15. Kindly illustrate what was done to achieve the objective(s) which you have circled.

16. Was this privatisation effort an isolated event or was this part of a general structural reform on the part of the policy authorities?

17. How long was the implementation of the privatisation process?

    a) 3 - 9 months
    b) 12 months
    c) 18 months
    d) 24 months
    e) greater than 24 months

18. What were the reasons why the implementation period took that duration of time?

19. What type of structure was put in place for the management of the privatisation process? _____

20. What was the total wage bill before the enterprise was privatised?

21. What was the staff complement before the enterprise was privatised?

22. Was the enterprise generating a profit/surplus before privatisation?

23. How long did the enterprise exist before it was privatised?

24. Did the government receive a fair deal for the privatisation effort?

25. Upon reflection would there be anything regarding the privatisation effort which you would have done differently?