FISCAL SUSTAINABILITY AND DEBT IN SMALL OPEN ECONOMIES:

An Application to the Caribbean

DeLisle Worrell, Team Leader

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CARIBBEAN CENTRE FOR MONEY & FINANCE

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by

DeLisle Worrell (Team Leader), Denisa Applewhaite, Rumile Arana, Elmelynn Croes, Harry Dorinnie, Kari Grenade, Julia Jhinkoo, Jason LaCorbiniere, Brian Langrin, Edwina Matos-Pereira, Sidonia McKenzie, Ankie Scott-Joseph, Lylia Roberts, Latoya Smith, Rasheeda Smith and Allan Wright

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Preface

This little volume is remarkable, even before it is read, because it is a model for the future of Caribbean integration. My co-authors are from across the region, from Suriname in the east to Belize in the west, and from The Bahamas in the north to Trinidad and Tobago in the south. Everyone joined the project out of a conviction of the importance of the issue of fiscal sustainability, and for the opportunity to enrich our understanding of this controversial topic. We all worked together enthusiastically, and the experience has been richly rewarding for us all. I would therefore like to say a heartfelt thanks to everyone who participated in the analysis and writing of this book, and to offer congratulations to everyone for helping to produce a study which breaks new ground and makes a persuasive case for a novel and improved way of assessing fiscal sustainability.

Our thanks go also to the Caribbean Centre for Money and Finance, its interim Executive Director, Dr Compton Bourne, and the staff of the Centre, for sponsoring the study, funding the participation of some authors, arranging and hosting conferences for the team, and assuming responsibility for editing and publishing our book. Collaborations of this kind have been among the most enduring outputs of the Centre over the years, and with the effective use of telecommunications they can be undertaken more efficiently than ever before. In this regard we hope our study will set the template for much of the future activity of the CCMF.

Our thanks go also to the Governors and presidents of participating central banks, for their endorsement and support of this project, to the staffs of the banks who provided our support, and to our reviewers, Dr Tarron Khemraj, Dr Shelton Nicholls, Dr Winston Moore, and an anonymous referee from the Centro de Estudios Monetarios Latinoamericanos (CEMLA), who all provided comments that helped to improve the book. As always with reviewers, they do not bear any responsibility for the views expressed in this book, and as with all publications of the CCMF, the opinions expressed are not intended to be representative of the views of any participating institution.

DeLisle Worrell
November 15, 2014

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Introduction

The adverse impact of sovereign debt defaults on the international financial system has occasioned intense interest in methodologies for assessing sovereign debt risks. This is manifest in an outpouring of studies, research which has uncovered the fact that the riskiness of sovereign debt is determined in each case by a complex interaction of factors, including Government tax, expenditure and financing policies over time, and the state of domestic and international financial markets. The large number of factors, many of them unique to individual cases, and the fact that social and political considerations enter into the mix, all serve to complicate the task of arriving at generalisations that are robust in application across countries.

The most comprehensive approach to the problem, by the World Bank and the International Monetary Fund (IMF), attempts to address this problem by placing countries in categories, and developing guidelines specific to advanced countries on the one hand, and emerging market and developing countries on the other. They also classify countries by the strength of institutions and other factors that bear on a country's ability to finance high levels of debt. However, the Fund-Bank analysis is flawed in at least two critical dimensions, which may call into question the conclusions drawn from their analysis of sovereign debt: they concern themselves exclusively with the question of sustainability, and they use the same tools for small countries and large.

The fact that a country's fiscal strategy is sustainable, and that debt obligations are serviced fully and on time, is not the only consideration in deciding whether that strategy should be continued. Other considerations relate to the efficiency with

which Government delivers public services, the extent of Government involvement in commercial services, and the degree of domestic market distortions caused by Government activity, among others. Some of these factors may be related to the overall development of the economy, in ways that are not easily generalised.

There is therefore a need to distinguish between fiscal strategies that are not sustainable – those that will fail or dissolve into crisis if continued – and those which should be altered in the interests of economic and social development, even though they are perfectly sustainable in any practical sense of the term. Agents in financial markets, whether domestic or abroad, are interested in sustainability above all. The principal risk to the credit they provide to sovereign states is that fiscal strategy will drive the budget to a crisis, a situation in which government will be unable to service its debt, no matter how committed it might be to do so. That is the risk to be analysed in this study. The major contribution of the present study is to provide an objective measure of this risk, conditional on the structure of the economy, the size of the deficit and the way in which the deficit is financed.

There remains a risk that a sovereign with a sustainable fiscal strategy may nonetheless decide to renege on its obligation to service debt in full. They may do this for good reason – that it is not in the best long run interests of the country – or for bad. The process may be done in a way that is desirable – through fully informed discussion among all parties, and a genuine search for a solution that is the best for everyone under the circumstances – or it may be done in an arbitrary or coercive way. However, lenders have powerful weapons to deter borrowers from reneging, even when the borrower is a sovereign, among them the ability to shut the borrower out of credit markets in the future. Sovereign borrowers are aware of

this, and have avoided arbitrary defaults in whole or in part, with only a handful of ill-advised exceptions. This is true of the Caribbean, as we will show in Chapter 3.

The focus of our study is fiscal sustainability, that is, whether Caribbean sovereigns have a strategy in place that will avoid a situation where, with their best efforts, they are unable to fully service their debt. This is a matter about which definitive statements can be made for most countries over a medium term horizon, both in circumstances that we may reasonably expect, and under worst-case assumptions. Fiscal sustainability in this sense is what financial market participants need to be concerned about. Beyond this, lenders should take a case-by-case approach, taking full account of each country's circumstances whenever they are approached to discuss changes in the structure of existing debt. As in the case of an individual mortgage, the appropriate procedure is to arrive at a mutually agreed maturity and interest structure that is in the best interests of the country and of the lender. These are issues that are clarified in Chapter 3, and that will be pursued elsewhere.

A major contribution of our study is to bring greater clarity to the discussion of sustainability. We develop an objective measure of sustainability, based on the ability to pay: the fiscal strategy becomes unsustainable at the point where Government does not have the wherewithal to fully service its debt obligations. It is important to limit the notion of fiscal sustainability to a concept that can be objectively measured, because the fiscal sustainability indicator is closely watched by financial markets. If the indicator used is heavily influenced by arbitrary judgments and inappropriate calculations, market participants may be misinformed, and may judge sound credits to be risky, while underestimating the risks in other credits which appear sound. Our study

therefore focuses on the objective "ability to pay" criterion of sustainability, about which unambiguous statements can be made, conditional on the state of the world.

Long before this point is reached, the burden of debt service may be diverting financing from activities that are priority from the point of view of accelerating economic development. The way in which the fiscal deficit is financed may also inhibit development, by transferring funds to relatively wealthy bondholders from relatively poorer taxpayers, thereby worsening the distribution of income. Apart from all this, there may be reasons to alter fiscal strategy because Government is perceived to be too large, inefficient or too intrusive.

It is important to distinguish between the sustainability of the fiscal strategy, which may be objectively determined under specified circumstances, and the other considerations just mentioned, which cannot be determined in the same way. We may estimate the conditional probability of a default event because Government does not have the wherewithal to pay; a similar calculation of a limit on the size of Government, or its ability to divert finance from development priorities, involves a large element of judgment, and the computation cannot be done in an objective fashion.

Our second innovation is to distinguish between large economies and small economies such as those of the Caribbean. A small economy is obliged to concentrate on the export of a limited number of commodities in which it can attain sufficient production size to become internationally competitive. Compared to this export list, the range of producer and consumer commodities required by the growing economy is very large. The small economy grows by generating sufficient foreign exchange inflows from

the internationally competitive sectors, to supply the increasing import needs of the growing economy. By contrast, large countries have additional growth options, through import substitution and the growth of domestic production for domestic consumption. The balance of external payments assumes an importance for small countries that it does not for large countries.

Our study employs this structural reality to develop an objective measure of the sustainability of the fiscal strategies of Caribbean countries, which are all small and highly specialised in international commerce. If the combined impact on foreign currency demand of Government external debt service and the wealth effects of domestic debt results in an excess demand for foreign exchange, Government will, in time, exhaust the country's foreign reserves in its efforts to service the debt. If corrective action is not taken in a timely manner, Government will be unable to service the foreign debt at that point. In the current study we develop a methodology which enables us to make a conditional forecast of the point of unsustainability, and we do evaluations of Caribbean countries using this tool.

Our study provides an objective measure, for small open economies, of the risk that fiscal policy may render it impossible for Government to fully service its debt obligations. The methodology we develop does not depend on judgments about a forecast growth rate, interest rates, discount rates, social stability, political will, institutional resilience, the ratio of debt to GDP or any of the usual caveats and assumptions of the conventional analysis. The test may be applied without regard to product or factor market structures, or the macroeconomic model preferred for the analysis.

Chapter 1, entitled "Fiscal sustainability in the small open economy" uses an intuitive concept of sustainability which corresponds to the image in the popular mind and in the minds of financial market agents: the fiscal strategy becomes unsustainable when Government does not have finance sufficient to meet its obligations in full and in the currency of the debt. Our concept of sustainability is an objective one; we do not speculate on Governments' willingness to pay, but focus on the ability to pay.

Our study distinguishes between sustainability and what may be considered the optimum fiscal strategy. We focus on sustainability, and we have nothing to say about what might be the optimum fiscal strategy, other than to point out the many non-quantifiable factors that must be taken into account in deciding what is the optimum. We also point out that much of what is written under the heading of fiscal or debt sustainability is in fact not about sustainability as most people understand that word. In normal usage, a strategy becomes unsustainable at the point when you are no longer able to continue along that path. That is the sense in which we use the term in this study. In contrast, much of the literature cited in Chapter 2 does not identify a point at which the fiscal strategy collapses; instead, they argue that the fiscal or debt strategy slows growth beyond a certain threshold. In other words they identify a point at which, in their view, the fiscal deficit and debt are optimal, but the strategy may be sustained well beyond that point, and for many years.

Chapter 2 explains the logic behind the tool we have developed to pinpoint when fiscal strategy becomes unsustainable in the small open economy (SOE). Foreign exchange plays an essential role in the growth of the SOE. These countries export a limited range of internationally traded goods and services in which they are competitive, and

employ the foreign exchange earnings to import the range of consumer and producer goods the economy needs. Small economies do not have the capacity to achieve an efficient scale of production for more than a handful of commodities, and therefore there is virtually no scope for import substitution. It follows that a fiscal strategy that provokes a demand for foreign exchange that is in excess of the available supply cannot be sustained. That is the principle underlying the methodology used in this study.

In Chapter 1 we introduce a forecasting model which shows the impact on the balance of external payments of Government debt servicing and the financing of the Government deficit. The model is fully articulated in Chapter 4. The channels through which the fiscal deficit will principally affect the balance of payments are via the servicing of the external debt, and the impact of fiscal expansion and domestic financing on aggregate expenditure and imports. In Chapter 1 we explain that there may be several reasons why fiscal consolidation and the reform of Government operations may be warranted, even when the fiscal strategy is sustainable. These reasons include the desire to achieve greater efficiency of the delivery of Government services, and/or a national consensus that the size and scope of Government activities are inappropriate.

Chapter 2 reviews the literature on debt and fiscal sustainability, illustrating the diversity of theoretical and empirical approaches to the subject. The available methodologies are all flawed in one way or another, and they are inconsistent with each other. At the end of the review no unambiguous concept of fiscal sustainability emerges, and no indicator, suite of indices, or methodology can be identified as offering the most reliable guidance. The approaches all involve judgments, sometimes about things which are non-

economic in nature, such as a government's willingness to meet its payment obligations. In addition some methodologies require conceptually troubling assumptions, such as intergenerational equity, and arbitrary choice of sensitive parameters such as rates of discount of future payments obligations.

Chapter 3 reviews the fiscal experience of several Caribbean countries in the last one and a half to four decades, depending on the country. The finances of all the countries included in the study have weakened over time, and debt levels have been on the increase, relative to GDP. The 2008 international economic recession aggravated the situation, and fiscal consolidation is underway in all the economies analysed for this study. Four of 15 countries in the Caribbean Community (CARICOM) and the Dutch Caribbean (the group covered by our studies) had exchanged or restructured government debt since 2008.

Chapter 4 is the core of the study, where we describe the methodology for determining fiscal sustainability in the small open economy, and use it to evaluate the fiscal strategy of several Caribbean countries. We identify periods of past unsustainability for each country, assess the current fiscal situation, and conduct stress tests to show how far distant is the current fiscal situation from the point of fiscal unsustainability.

Our study aims to provide reliable information to financial markets about the objective limits to Caribbean Governments' ability to service their debt. We have no opinion about Governments' willingness to service debt, or the optimality of the overall fiscal strategy in terms of the economic development of countries. What we do show is that Governments that have not reached the point of

unsustainability do have the ability to service their debt obligations. We are also able to assess the way in which Governments may lose the ability to pay.

Chapter 1

Fiscal Sustainability in the Small Open Economy

The aim of the project is to measure the practical limits to the financing of government deficits in small open economies, and what implications this may have for government debt. This approach lends clarity to the discussion of the sustainability of fiscal strategy. The fiscal strategy becomes unsustainable when successive deficits drive the government to the upper limit that exhausts its ability to fully service its debt obligations. Viewed in this way, the concept of sustainability is unambiguous: the fiscal strategy is unsustainable if the conditional forecast of future deficits over the medium term pushes government finances to the point where debt service obligations cannot be met in full; the fiscal strategy is sustainable otherwise.

At bottom, economic policy is about keeping inflation acceptably low, and achieving the highest rate of economic growth that may be sustained over time. In the small open economy (SOE), government cannot drive economic growth through fiscal expansion, because government services do not earn foreign exchange; in the SOE import propensities are very high, and additional foreign earnings are needed to finance the imports required by the growing economy. Sustained growth of SOEs is led by the tradable sectors of their economies; fiscal policy contributes to growth to the extent that it provides incentives and infrastructure to accelerate the production of tradables. On the distaff side, fiscal expansion has the potential to reduce growth rates and generate inflation to the extent that it pushes aggregate expenditure and the demand for imports beyond the amount of foreign inflows. The ensuing 22 devaluation drives up inflation rates and creates an uncertain climate for investors. The key to fiscal sustainability is therefore

to ensure that fiscal policy facilitates the growth of tradables, and that government activity does not drive the demand for foreign exchange above the supply.

An essential difference between the SOEs of the Caribbean and large, relatively self-contained economies such as Brazil, is that for SOEs the impact of fiscal deficits and debt on economic growth and inflation is indirect, via the balance of payments. In the case of large economies, the impact of fiscal expansion on output and inflation is direct: the multiplier effects of government spending, whether large or small, add to the domestic income stream, for the most part, and only a small proportion leaks abroad via imports. If there is monetary expansion to finance the additional government spending, that too has inflationary effects that are mostly domestic. In contrast, government expansion in the SOE creates a demand for imports that is almost as large as the expansion in most cases, and may in fact be larger than the government expansion, if there are multiplier effects. Furthermore, money creation to finance fiscal expansion also has its largest potential effects via the balance of payments: direct effects are limited to such demand as may be stimulated for non-tradable commodities, but they in turn will create a demand for imports. More important, though, is the direct impact of money creation on imports, because of the addition to aggregate spending power. The inflationary impact of money creation is therefore modest, until the point where the imbalance of external payments results in a devaluation of the exchange rate.

Following this logic we may define the point where the fiscal deficit of an SOE becomes unsustainable, as the point when the additional foreign exchange demand resulting from fiscal policy exceeds the supply to such an extent that the foreign exchange reserves become depleted. The fiscal stimulus to aggregate demand and imports comes principally from the impact of

money created to fund the deficit, and there will be an additional charge to service any new external debt. If fiscal expansion is funded entirely by credit from the domestic private sector, there is an impact on the foreign balance only to the extent that bondholders have a lower spending propensity than taxpayers, and this effect will reduce pressure on the balance of external payments. At some point before foreign reserves are completely exhausted, the market comes to expect a large devaluation. That often provokes capital flight, the exhaustion of foreign reserves, and a deep devaluation which amounts to overkill.

"Sustainability" has a clear and specific meaning when viewed in this way. If fiscal policy does not succeed in steering the economy away from this point, a balance of payments crisis is inevitable. It is worth pointing out the critical difference between this sustainability indicator and conventional measures such as the debt-to-GDP ratio: when the foreign reserves limit is reached, there is a violent market reaction, and a balance of payments crisis ensues. In contrast, the conventional indicators do not mark any market-driven transition, and their purported thresholds are academic, because market agents observe no change at the point the presumed threshold is reached.

In order to assess fiscal sustainability in the open economy, we need to determine the impact of deficits and financing on the balance of external accounts, and measure the resulting impact on foreign exchange reserves. This impact may be estimated using any appropriate macroeconomic model of the economy. Our study which introduced this methodology (Belgrave et al., 2010) uses a simple monetary model of the balance of payments, but in practice a more fully articulated model of the economy is preferable, if available. The model is used to estimate the impact of fiscal variables on the balance of payments; to this is added the cost of government external debt service. The resulting foreign exchange surplus or deficit is

applied to the level of foreign exchange reserves in the previous period. If, as a result, the reserves level falls below a threshold level by the end of the period, the fiscal deficit is deemed to be unsustainable. In Belgrave et al. (2010), a threshold equivalent to 12 weeks of imports is used, because that is the minimum level with which the Barbadian foreign exchange market is comfortable. This is a commonly used threshold, but the methodology permits us to employ whatever threshold prevails in the foreign exchange market in each country.

The approach to fiscal sustainability recommended in this study is simple, intuitive and empirically based, in contrast to the conventional approach, which is more complicated than is usually admitted, sometimes counter-intuitive, and imposes thresholds that are arbitrary. Our approach provides a clear-cut definition of sustainability which is intuitive: the system becomes unsustainable when failure occurs.

In the SOE, theory and experience dictate that policy makers should have an exchange rate objective. The only difference of opinion nowadays is about whether the objective should be to target a rate or to minimise the volatility of the exchange rate. Successful exchange rate targeting requires that the central bank maintain adequate foreign reserves to intervene appropriately as and when necessary. That in turn implies that external balance is maintained, and that the inflows of foreign exchange on the current and capital accounts are sufficient to cover outflows. Fiscal policy affects those outflows, by virtue of its impact on aggregate demand. Fiscal strategy becomes unsustainable when it drives foreign currency demand to exceed inflows, and to exhaust foreign exchange reserves. At this point the exchange rate target becomes unobtainable and there is policy failure. This is the point where fiscal policy becomes unsustainable. This point may be clearly identified, and scenarios and conditional

forecasts can be analysed, as to whether they steer the economy clear of the point of failure.

Our approach explicitly incorporates the transmission mechanisms by which the fiscal strategy drives the system to failure. The proposed methodology allows us to model and observe the economic behaviour which characterises the economy and to observe how it reaches the point of failure. Fiscal expansion generates a foreign exchange deficit which eventually grows large enough to deprive the authorities of the essential ammunition for foreign exchange management, that is, foreign exchange reserves. In the simplest model, we can capture the transmission mechanism through just two parameters: the fiscal multiplier and the propensity to import. More sophistication may be introduced with structured models that incorporate wealth effects and indicators of policy credibility, as well as feedback and second round effects. An examination of the transmission mechanism lends clarity to the discussion of policy options, whose effects may be traced through the system.

This approach incorporates indicators of external market pressure (EMP), the exchange rate and the level of foreign exchange reserves; in SOEs people care about EMP, and they are right to do so. Blanchard et al. (2010) admit that capital inflows and outflows may cause large fluctuations in exchange rates which can result in big disruptions in economic activity. "A large appreciation may squeeze the tradable sector and make it difficult for it to grow back if and when the exchange rate decreases. Also, when a significant portion of domestic contracts is denominated in foreign currency (or is somehow linked to its movements), sharp fluctuations in the exchange rate (especially depreciations) can cause severe balance sheet effects with negative consequences for financial stability, and thus, output." This paper, co-authored by the Economic Counsellor

and head of the IMF's Research Department, and intended for the guidance of Fund staff in their analysis of member countries' policies, gives that institution's official sanction to what has for decades been standard practice in small open economies with a superior track record. The exchange rate target, whether it is a peg or a rate that moves in a predictable way with low volatility, is highly prized in SOEs precisely because they are acutely aware of the adverse consequences of failure. Policies to balance the external account and preserve adequate foreign reserve levels gain traction in these economies because of that, even when they involve a contraction in real output.

This approach is the appropriate one for SOEs, because it respects the structural nature of their foreign exchange constraint. The implications may be appreciated by comparing the transmission mechanism in SOEs, which are foreign exchange constrained, with large economies, which do not have a foreign exchange constraint on growth. In the SOE, as outlined above, the transmission channels by which fiscal expansion drives the economy to a point of failure are via external imbalances, and there is a defined failure point, marked by a balance of payments crisis. In a large diversified economy there is no corresponding defined point of failure and crisis. Instead, the conventional story is that the larger the deficit, the more expensive it becomes to finance it; if the debt keeps on rising too fast, the cost of debt service becomes prohibitive, and a default ensues. However, there is no clearly defined point of failure, because what is “prohibitive” is a matter of judgment, and the point at which the cost of debt service becomes prohibitive cannot be uniquely parameterised. This approach relies on rules of thumb, for example with respect to the interest cost of government debt, as a percentage of government revenue. These rules of thumb have proven too imprecise for practical policy guidance. More seriously, because this approach is not focused on the balance of payments, if applied to SOEs it

may suggest that fiscal policy is sustainable even though a balance of payments crisis is imminent. This was the case in Barbados in 1991, when even though debt-to-GDP and total interest/revenue ratios were low, the fiscal strategy of the preceding years was clearly unsustainable, and ultimately drove the economy to a balance of payments crisis. The Belgrave et al. (2010) methodology clearly shows the fiscal policy to be unsustainable in those years, whereas the fiscal roots of the balance of payments crisis cannot be detected using the conventional methodology.

Conversely, conventional analysis may suggest SOE fiscal strategies are unsustainable even though they will not lead to balance of payments failure even in worst case scenarios. This is the case, in particular, with studies which purport to find a relationship between government debt and economic growth. There is no convincing evidence of such a relationship in the Caribbean or elsewhere, and there is no reason in theory or practical observation that leads us to expect any relationship that holds good across many countries. The intuitive argument relies on the fact that government borrowing to build social and economic infrastructure clearly promotes economic growth, but borrowing to finance current spending may not necessarily be growth-enhancing. However, it does not follow that at low levels of debt, borrowing is for infrastructure, and that governments finance current spending by borrowing only at high levels of debt. Nor is it the case that all government investment is in appropriate social and economic infrastructure, produced at fair market prices for products and finance. It is therefore no surprise that there is little empirical evidence for the purported relationship between debt and growth, much less that there is an optimal level of debt. A test by economists at the IMF has recently uncovered no relationship between the ratio of debt to GDP and economic growth, across the widest range of countries so far tested (Pescatori et al. 2014). The exposure of

the flaws in the Reinhart-Rogoff analysis that was previously cited in evidence has been an acute embarrassment for the economics profession (Herndon, Ash and Pollin, 2013). In fact, the evidence is scant and inconsistent; in an overview paper published in 2012, Reinhart, Reinhart and Rogoff (2012) found only six studies globally that tested the relationship in the period since 1800. They all used different methodologies and data definitions, and their results are not comparable. A recent study for the Caribbean appears in Greenidge et al., (2013), and is discussed in Box 1 on page 34.

The conventional approach is complicated. In a recent guidance paper to IMF staff on debt sustainability for market access countries, the suggested methodology involved the estimation of the net present value (NPV) of future primary fiscal balances, for comparison with the NPV of the public debt, and forecasting forward for a decade (IMF, 2008). This involves choice of interest rates, exchange rates, growth rates and deflators. Because parameterisation is largely arbitrary, stress tests on the parameters are advised, as well as a range of scenarios for the growth of the economy. With all that, the paper admits that the achievement of the solvency criteria may not be feasible, that the calculation says nothing about the level of debt (only its evolution), and that the methodology is blind to the risk that maturing debt will not be rolled over.

The IMF-World Bank guidance for the assessment of debt sustainability in low income countries is also complex (IMF, 2004). It involves "(i) a standardized forward-looking analysis of the debt and debt-service dynamics under a baseline scenario and in the face of plausible shocks; (ii) assessment of debt sustainability guided by indicative country-specific debt-burden thresholds related to the quality of a country's policies and institutions; and (iii) an appropriate borrowing (and lending) strategy that contains the risk of debt distress." Sustainability is

based on notional thresholds for the net present value of projected debt, the NPV of debt to exports, the NPV of debt to government revenue, debt service to exports, and debt service to revenue. The thresholds are differentiated in every case between countries depending on whether their institutions and policies are judged to be poor, medium or strong.

The conventional approach is sometimes counter-intuitive. A recently cited example of this is the fact that the fiscal and debt profile of the UK is currently similar to that of Spain, but whereas there is a general perception that the Spanish fiscal policy is unsustainable, the UK fiscal policy is deemed to be sustainable by the financial markets. As a result the UK is able to avoid the punitive debt service costs which the market imposes on Spain. It is also the case that Barbados' debt-to-GDP ratios are of the same magnitude as those of industrial countries, and Barbados' policy making institutions are strong by international comparison, yet Barbados' debt is judged not to be of investment grade, whereas most industrial countries with comparable debt levels and institutional strength are deemed to be of investment grade.

The conventional approach uses thresholds which are arbitrary. In the period before the recent financial crises, the generally accepted maximum limit for fiscal sustainability was thought to be a debt-to-GDP ratio of about 60 per cent. Japan, with a ratio more than twice the maximum, which had persisted for a decade, was thought to be the exception that proved the rule. In the aftermath of massive financial rescue packages, however, there were few industrial countries left with ratios of less than 60 per cent. A new norm of 100 per cent has taken hold in financial markets, at least for developing country debt, but it is just as arbitrary as its predecessor.

The sustainable and the optimal

There is a considerable difference between what is sustainable and what is optimal. In the recent discussions on fiscal sustainability these terms have been used interchangeably. However, it is obvious that suboptimal policies may be sustained indefinitely, if there are no market forces at work to cause a deviation. The recent study on Caribbean economies by Greenidge et al. (2013) offers no opinion on the sustainability of debt or fiscal policy; their claim is that the growth rate in countries with a debt-to-GDP ratio above 56 per cent, is below that of countries with lower ratios, all other things being equal. All other economic circumstances are not equal, of course. What is more, for countries with higher ratios, their best policy might well be to allow the ratio to remain high, or even to increase, in circumstances where debt reduction would require an immediate and certain contraction of income, whereas the presumed growth benefit of a lower debt-to-GDP ratio is hypothetical and in the future.

We have the paradoxical conclusion that in order to enhance the growth rate (by reducing the debt-to-GDP ratio) the required policy change involves a reduction in growth. In general, the presumed benefit from a reduction in debt-to-GDP ratios is hypothetical and poorly grounded in theory and evidence, and offers no useful guidance for fiscal policy. In particular, the presumed relationship offers no guidance on the sustainability of fiscal policy. Using the ratio as a trigger for policy adjustment carries a risk of implementing policies with deleterious long term consequences for growth, such as debt haircuts that undermine domestic financial markets and damage international market access.

A useful way of representing possible states of the world is given in the matrix below:

	Is Fiscal Policy Sustainable? (Top answer)	
Is Fiscal Policy Optimal? (Bottom Answer)	YES YES	NO YES
	YES NO	NO NO

It is vital to assess which element in this matrix best represents the country's circumstance, because the policy response must be tailored to the circumstances. In general, an unsustainable situation demands a more urgent response than does a suboptimal one. What is more, we argue that the signs of unsustainability are clear, and that one may demonstrate what tendencies and under what assumptions fiscal policy will lead to a point at which the authorities will lack the wherewithal to fully service the national debt. In contrast, the optimality of fiscal policy is hypothetical: it requires a counterfactual of an alternative fiscal policy which produces faster growth. In the absence of a counterfactual, the practice is to draw inferences from countries and episodes which are presumed to be similar to the country that is the focus of attention. What we need always to bear in mind is the range of assumptions we make in presuming that countries are sufficiently alike that similar fiscal strategies will have similar outcomes. These include similarities of tax systems, preferences for public provision of public goods, financial structures, production systems, openness to trade and finance, technology, level of economic development, financial market development, labour market flexibility, institutional development, development of the institutions of civil society,

size of population, land area, etc. Most studies also make the assumption that economic episodes are comparable over time, which is counterintuitive in an age of rapid technological change.

Our study focuses on methods of determining that fiscal strategy is unsustainable, for the reasons just cited: it is the most urgent problem, and the one that is most readily detected. An analogy may be drawn with canoeists on an unknown river. The roar of a waterfall up ahead is a signal of unsustainability, whereas arriving at a fork in the river poses a question of optimality, because if you choose the wrong fork you will need to retrace your steps. As we shall see in Chapter 2, not only does most of the literature ignore the roar of the waterfall, they imagine that the choice of tributary is a problem of the same order of urgency as is the avoidance of the waterfall. Indeed, many writers are unable to distinguish the unsustainable from the suboptimal, and write as though they are the same.

Sustainability limits at the point of insolvency

The approach to fiscal sustainability which is advanced in this paper, to define the point of unsustainability via the flash point where exchange market pressure becomes explosive, may be derived from conventional notions of solvency. For convenience of exposition, let us consider separately a dictionary definition of insolvency, i.e. inability or failure to pay debt obligations as they fall due (Webster's definition), and what we may term a "technical" insolvency, where the value of government's liabilities exceeds the value of its assets. We will show that a technical government insolvency is an academic curiosum, of no practical interest and having no economic consequence. The inability or failure to meet repayment obligations most certainly has harmful economic consequences, in contrast.

Suppose we determine the point of insolvency where government is unable to meet its obligations to pay interest and repay principal amounts when they fall due. If all debt is in domestic currency, repayment is assured, through the issuance of new debt at the appropriate internationally competitive market interest rate. (That is, the rate that includes the prevailing country risk premium.) Extremely large stocks of debt, relative to GDP, may be refinanced in this way.

Some difficulty may emerge, in the case of domestic debt, if the country risk premium becomes very large, as a deterrent to capital flight or for any other reason. Jamaica is a case in point, where country risk premiums have been high for most of the past two decades. How can we define a point at which interest costs on domestic debt trigger an economic reaction that defines the point of unsustainability? The reason no such point exists is that in the aggregate, the recipients of the interest income (domestic income earners) are the same collective which pays taxes and benefits from government services. Jamaican income earners as a group receive the entire amount contributed in tax payments that go toward interest payments on domestic debt. Naturally, within the group of national income earners, the bondholders receiving interest are fewer (and wealthier, on average) than the taxpayers who contribute to government's revenue. This is the nub of the issue: the service costs of domestic debt are, at bottom, a matter affecting the distribution of income. One cannot observe a defined point at which the distribution of income becomes too unequal, and it follows that a maximum sustainable debt and debt service level cannot be defined in this way.

This logic applies to concerns about the crowding out of government services by interest payments which absorb a large proportion of revenue. The interest payments constitute a transfer from those who would have benefitted from the

government services foregone, to bondholders. That transfer may not be welfare-enhancing, but there is no clearly defined point or range of values at which it becomes unsustainable.

In sum, with respect to domestic debt raised at market rates from private domestic sources, there is no point or range of values for interest or principal where government is unable to pay debt principal and/or interest obligations as they become due. We cannot tell whether government might be unwilling to pay, or to pay in full, at any point, even with relatively low ratios. However, sustainability is about the ability to pay, not about willingness to pay.

The circumstances are quite different with respect to external debt. In this case, government may not be able to meet its obligations because of an inadequate supply of foreign exchange. There is also a major problem if domestic financing is by way of credit provided by the central bank, rather than from private domestic sources. In this case there is an addition to financial wealth, which may be expected to stimulate aggregate demand and a demand for foreign exchange, sufficient to seriously deplete the foreign reserves. Using an appropriate model, one may produce a forecast of the trajectory of fiscal deficits and their impact on the balance of external payments and receipts, conditional on alternative expectations about the international economy. If the forecast indicates that the external balance deteriorates to the point where foreign exchange market pressure becomes explosive, government will experience difficulty in meeting external debt service obligations, as will the private sector.

If we employ the dictionary definition of insolvency, therefore, the ability to fully service its external debt obligations is the only unambiguous measure of fiscal sustainability. By forecasting the impact of the fiscal strategy on the balance of payments over the policy horizon, one may derive the point at which foreign exchange market pressure builds to an extent that external debt service is likely to become problematic. There is no corresponding market-determined limit to domestic imbalances that do not spill over to the external balance through loss of confidence in economic policy and capital flight. Government is always able to roll over domestic debt so long as the fiscal policy is credible, and credibility is determined by external market pressure. If foreign reserves remain adequate and the exchange rate is not excessively volatile there is no motive to switch out of domestic assets, and government bondholders are happy to roll over maturing debt at market rates. Increasing levels of domestic debt and rising interest payments may adversely affect the distribution of income, but they do not trigger any market event that prejudices government's ability to service its debt. Of course, government may choose not to honour its debt obligations, whether domestic or external, even though it has the ability to do so, but this behaviour is both unpredictable and irrational, because of the lasting effects of debt default on the government's ability to finance future investment.

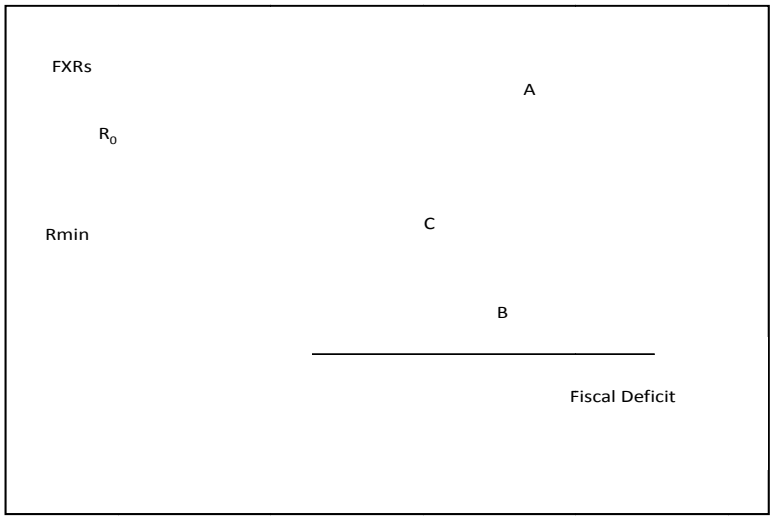
The technical definition of government insolvency – the excess of liabilities over assets – is a theoretical curiosum. The sum total of assets owned by government in any country is seldom measured, but it will always exceed the national debt by orders of magnitude. The flaw in the textbook approach to debt dynamics, which compares the economic growth rate and the real rate of interest, is that is assumes, incorrectly, that solvency is defined by the excess of national income over debt, rather than the excess of national wealth over debt, which is the correct

measure. A country becomes insolvent only when its debt to the rest of the world exceeds the total value of the country's wealth, which is difficult to calculate because there is no market in which it can be valued.

Fiscal sustainability and the foreign exchange constraint

We build a methodology for testing the sustainability of fiscal strategy on the basis of the exchange market pressure that results from the strategy. The fiscal strategy is unsustainable if exchange market pressure builds to the point where the authorities' exchange rate target cannot be met, whether that target is an exchange rate anchor or achieving an acceptably low degree of volatility. The procedure is shown conceptually in Figure 1, which uses the level of foreign exchange reserves as the indicator of exchange market pressure. Starting with an initial level of reserves of R_0, a fiscal forecast that follows the trajectory labelled A is sustainable, whereas the trajectory B is not. In the case of forecast B, when foreign reserves reach a minimum level R_{min} with which the market is comfortable, capital flight is likely, and an intensification of the external market pressure. The point C may therefore be considered the point at which the fiscal strategy becomes unsustainable. In the studies undertaken for the current project we prepare fiscal forecasts and project their estimated impact on foreign reserves and/or other indices of external market pressure, and we write alternative scenarios to stress the outer limits of fiscal sustainability.

Figure 1. Foreign Exchange Market Determined Fiscal Unsustainability



Sudden stops when debt is sustainable

Small countries that belong to a currency union may experience a "sudden stop", an unwillingness on the part of financial institutions and the private sector to roll over government debt at market prices, even though the country's fiscal stance does not cause the balance of payments of the union as a whole to deteriorate. The finance previously made available to the government affected remains within the union, but not necessarily within the country. The actions of the central bank of the currency union will determine how this fiscal situation may be resolved. Let us consider the possibilities.

First, if the previous holders of government paper switch to investments outside the currency union altogether, the foreign exchange constraint kicks in and the analysis is no different than for small countries that have their own currency. Our

methodology will pick up the fact that the fiscal strategy of the country in question threatens the external balance of the union as a whole. The fiscal stance strategy will in effect have become unsustainable, not because of “fundamentals”, but because of capital flight. Let us consider only those cases where the investment stays within the union. If investors deposit the proceeds from maturing government bonds with the domestic banking system, the banks' treasury accounts with the central bank increase by an equivalent amount. The central bank may repair government financing by advancing this liquidity increase to government at market interest rates. In this case there are no real effects.

A shortage of finance for government does occur, however, where the central bank does not redirect the additional liquidity which has accumulated in banks’ treasury accounts, in the form of additional lending to government. In the case of the ECCU, for example, the central bank does not lend to governments. The appropriate response in this case might be to relax the restriction on central bank lending to government; in effect the central bank may reverse financial transfers within the union that are initiated by the private sector. This central bank support would be conditional on the implementation of an appropriate fiscal strategy by the government in question, designed to restore the confidence of domestic investors in its sustainability

In circumstances where holders of maturing government bonds invest the proceeds in private sector projects within the union, or with the governments of other currency union members, the central bank would need to create new money to fill the financing gap, with implications for the balance of payments of the union as a whole. If the impact on the balance of payments is small, the fiscal deficit would be considered sustainable, using the foreign exchange sustainability criterion. However, there might be financial transfers within the currency union as a

result, with some private sector funding being transferred from the country affected by the sudden stop, to others within the union.

The reason for the loss of confidence by investors may be a sharp increase in the fiscal deficit and the need for new financing, or it may be that investors have become alarmed by a persistent trend of rising fiscal deficits. In either case, fiscal correction is indicated. Were the central bank to buy bonds issued by this government, it might be financing capital flight, to the extent that investors lose confidence in the stability of the union as a whole.

The sustainability of the aggregate fiscal strategy of a small currency union like the ECCU may be assessed using the foreign reserve adequacy criterion, because the union as a whole is subject to the foreign exchange constraint. However, this criterion will not alert us to the possibility that private financiers may deny financing at market rates to countries in whose fiscal strategy they lose confidence, even though there is no danger of reaching the minimum foreign reserve threshold for the union. The problem is similar to that facing the European Union. From a strictly economic perspective the deficits of small member countries may be easily financed, but private financial institutions, the central bank or member governments of the union are not prepared to provide finance or transfers beyond a certain point. However, no methodology exists by which that point may be uniquely determined, although it is now clear that the three per cent fiscal deficit-to-GDP limit to which both members of the EU and ECCU have agreed is too restrictive to be practical. In both regions this limit is most often observed in the breach.

The European Central Bank (ECB) has shown how the central bank of the currency union may relieve the financial constraint

on an individual government by offering finance, directly or via commercial banks, conditional on the achievements of targets for fiscal consolidation. In the case of central bank of a union of small very open economies like the OECS, a limit for such financial accommodation would be guided by the prospective impact of this money creation on the foreign exchange reserves of the union. The accommodation would be to buy time for the fiscal adjustment to be implemented and to take effect, and it would be limited so that it does not create unsustainable external market pressure for the union as a whole.

Debt market structures and economic growth

The relationship between fiscal policy, debt and growth is influenced by the efficiency of the financial market. A useful measure of market efficiency is the real interest rate, the difference between the nominal interest rate and the rate of inflation. A high real rate of interest makes it difficult to borrow profitably for the long term: the borrower would need to employ the funds in ways that yield very high nominal returns, year after year. What is more, anyone who borrows at today's high real rate will find themselves at a competitive disadvantage should the real rate decrease at any time during the life of the project in which the funds are invested. In these circumstances, a strong bias towards short term funding emerges, and the availability of funding for fixed capital formation and employment generation is severely inhibited.

Countries that experience deep devaluation of their currencies often find themselves in this situation, once the external accounts have stabilised after the devaluation, and devaluation-induced inflation has subsided. During the period of the exchange rate crisis the financial markets restructure themselves towards the short end of the market: the supply of long term finance for fixed investment dries up, and funds reposition

themselves to take advantage of the high nominal returns available at short term. However, there is no mechanism to redress this bias towards short-term finance, once balance returns to the external accounts, the depreciation of the exchange rate is contained, and inflation rates come down.

It is unlikely that the market will correct this bias towards the short term of its own accord, because it is difficult to achieve real rates of return on long term investment in fixed capital projects that are comparable to the short term real interest rates. Moreover, there is the ever-present danger of a new round of devaluation, an additional source of uncertainty for anyone who invests for the long term, thereby losing the flexibility that a short horizon offers. In these circumstances the country may be stuck in a path of insufficient supply of finance for employment-generating projects. This is an equilibrium path, because there are no forces which drive the economy away from it, but it is a path of low potential growth.

However, there exists an alternative path of higher growth, which may be stimulated by a restructuring of the financial incentive system towards the long term. That path may be attained by reducing the real rate of interest to a level that is closer to the social optimum. For many years, Jamaica sought to achieve a reduction in the real interest rate through fiscal contraction, supported by conventional monetary tools. However, that strategy was repeatedly frustrated by the high cost of servicing the government debt, largely because of the high interest cost. Because of the established market bias towards the short term and uncertainty about future rates, attempts to reduce the rate through monetary policy failed to bring the rate down past a relatively high threshold, even with tight fiscal policy. That in turn meant that interest costs absorbed more than half of all government revenues, a situation that starved the country of long term investment financing.

The two Jamaica debt exchanges were designed to move the Jamaican financial markets from a low-growth, high-real-interest equilibrium, to a higher growth, lower-interest rate-equilibrium. The motive for the exchanges was not the imminence of a financial or balance of payments crisis, or any other event that would render it impossible for government to service its debt obligations in full. The fiscal strategy was sustainable, in the sense that, were it to be continued without alteration, it would not trigger any market reaction that would drive it off-course. However, the strategy was clearly not optimal, because it inhibited investment and contributed to the long term stagnation of economic output. The fact that a fiscal strategy is sustainable does not necessarily mean that it should be continued. Fiscal sustainability is only one of several criteria by which the fiscal strategy should be judged. A second reason might be to reduce excessively high real interest rates, in order to correct a bias against long term funding of fixed capital formation.

Structural issues of the medium term fiscal strategy

Other reasons to make changes in fiscal strategy might be to change the scope and/or efficiency of government services, or to reduce the size of government. These motives may be strong even in circumstances where fiscal deficits and debt levels are low, by international comparison. Moreover, efforts to reduce fiscal deficits and contain debt may add to the burden of taxation, in circumstances when the electorate has come to believe that it is already too highly taxed. The factors that inform public perception of the appropriate size of government are too numerous and complex to admit of easy analysis or generally applicable guidelines. These factors include social, political and psychological features of the society; preferences with respect to the choice of public or private delivery of a variety of services such as electricity, transportation and

sanitation; cultural traditions and history; and the perceived levels of efficiency in the delivery of government services. Perhaps the only generalisation which would be universally accepted throughout the Caribbean is that taxpayers do not currently get value for money, in terms of the efficiency with which public services are delivered. Over time, fiscal strategies everywhere should aim to reduce the burden of taxation, while at the same time delivering additional services and/or services of a much higher quality.

Summary

Our study provides financial markets with a tool for improved management of sovereign risk of SOEs, one that measures, in an objective way, the probability that the government is unable to fully service its debt obligations. At the moment, no such measure exists. The best of the available indicators involves a large element of individual judgment, and is therefore not ideal. In addition to the ability to pay, financial lenders also need to assess the borrower's willingness to pay, but that is an inherently subjective matter, about which no generalisations can be made. A tool which allows financial markets to distinguish between the ability to pay, the more tractable element, and the willingness to pay, greatly facilitates the better assessment of overall risk.

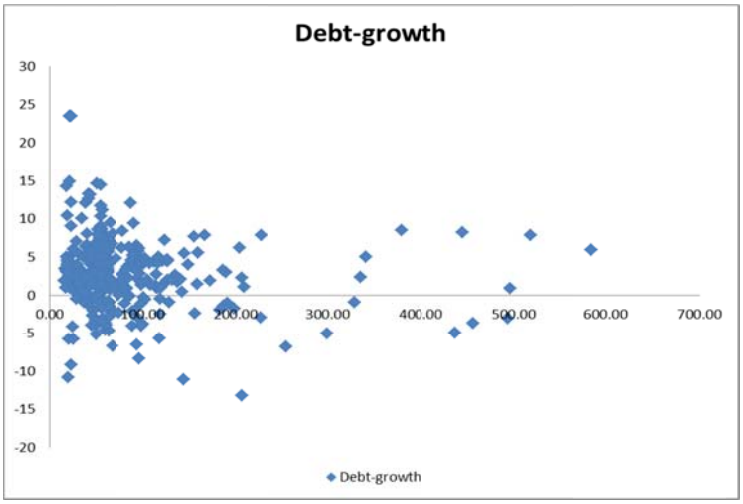
Box. Greenidge et al., 2012

A recent IMF working paper[1] concludes that, for Caribbean countries, "as debt rises beyond 30 per cent, the effects on economic growth diminish rapidly and at debt levels reaching 55-56 percent of GDP, the growth impacts switch from positive to negative. Thus, beyond this threshold, debt becomes a drag on growth." The title of the paper makes no reference to the sustainability of fiscal policy or debt levels. It is concerned with the optimal level of debt. It follows that no conclusions may be drawn from the results of this study about the riskiness of debt at any level.

The results raise a number of questions. The raw data for the study are plotted in the figure below. The paper's authors do not explain how they are able to conclude from this data that there is a maximum value debt at 55-56 per cent on the horizontal axis. To the naked eye, no pattern is discernible for debt ratios below 200 per cent. Other qualifications to the results that deserve further exploration include whether the sample of countries was large and diverse enough to yield reliable estimates, and whether all the relevant variables (for example, exchange rate changes and exchange rate regimes) were taken into account in the estimation.

[-1] Greenidge, Kevin, Roland Craigwell, Chrystol Thomas and Lisa Drakes, "Threshold Effects of Sovereign Debt: Evidence from the Caribbean," IMF Working Paper No. 12/157, June 2012.

Box (continued)



Chapter 2

A Review of the Literature on Debt and Fiscal Sustainability

Introduction

In this section, the main literature regarding debt and fiscal sustainability is reviewed. First, the main theoretical and empirical literature associated with the topic is explored. In the theoretical literature, the concept of sustainability and the various frameworks that have emerged to explain it are examined. In the empirical literature, an analysis of the literature that uses econometric models to explain sustainability is undertaken. Finally, a review of the relevant Caribbean studies on fiscal and debt sustainability is provided.

Theoretical and Empirical Literature on Debt and Fiscal Sustainability

Theoretical Literature

The terms "sustainability", "solvency" and "liquidity" as they appear in the literature are used in many different senses, and inconsistently from one study to another. The IMF (2002) establishes two conditions such that fiscal policy is considered sustainable: (i) the government's budget can be readily financed without large future adjustments in revenue and expenditure or without resorting to default or debt monetization; and (ii) external shocks do not result in debt problems. The IMF's guidance was that fiscal adjustments be economically, socially, and politically feasible. However, this

involves judgments about things which cannot be measured objectively. Blanchard et al. (1990) define a sustainable fiscal policy as one in which tax and expenditure policies can be maintained without a persistent increase in public debt, thus ensuring that the debt-to-GDP ratio eventually converges to its initial level. Adams, Ferrarini and Pak (2010) distinguish between static and dynamic sustainability. They explain that static sustainability refers to the situation in which the budget can be easily financed between periods and dynamic sustainability refers to the situation in which the budget does not cause a long-term explosion of debt. Wypolsz (2007) argues that the present discounted value of the government's current and future expenditures should not be greater that its current and future income, net of the initial debt. Natixis Economic Research (2010) maintains that Government may encounter temporary funding problems due to an anomaly in the functioning of financial markets even where there may not be an underlying liquidity problem.

The variety of definitions for fiscal sustainability leads to a diversity of theoretical frameworks providing concepts, definitions, and possible inter-relations between economic variables relevant to the determination of fiscal sustainability. The frameworks may not be consistent with each other, and may lead to different conclusions. Sarvi (2011) examines five different approaches for analyzing fiscal sustainability: (i) fiscal limits and debt ceilings, (ii) summary indicators, (iii) Model-Based Sustainability, (iv) the inter-temporal budget constraint (IBC) and (v) generational accounting. The IBC approach is widely used when assessing government solvency. The strengths and weaknesses of each approach are analyzed and are compared in what follows.

The IBC, also called the present value budget constraint (PVBC) approach, focuses on equality between the present

value of the flow of primary balances and the present stock of net debt. Bagnai (2004) argues that the IBC is not sufficiently restrictive, because it allows for explosive trajectories of the debt-to-GDP ratio. He argues that the IBC is a constraint imposed on debtors in defined inter-temporal equilibrium models, and therefore unsustainable debt paths will never be observed. Roubini (2001) argues that the IBC criterion is too flexible, since according to it, a government could run very large deficits for a lengthy period as long as it runs primary surpluses in the long run, which would affect government credibility. He suggests instead that government debt be considered sustainable as long as the public debt-to-GDP ratio is non-increasing. Another common and simple criterion for fiscal sustainability is the convergence of the debt-to-GDP ratio to a finite value, also called the boundedness criterion. The condition requires that eventually, debt cannot grow at a rate greater than the growth rate of the economy

Recently, some innovative approaches have been developed to estimate the public debt ceiling for a country. One tries to determine the fiscal limit for a country, and the second approach estimates the debt ceiling for a country based on past fiscal policy. Bi (2011) defines fiscal space, which gives the maximum level of debt that the government can accommodate with fiscal policy. Determining the fiscal limit of a country and comparing it to the present and projected future levels of debt give an indication as to how much fiscal policy space a government has. Bi attempts to estimate this limit by constructing an infinite-horizon model of a closed economy in which fiscal limits arise endogenously from Laffer curves. Ostry et al. (2010) introduce the concept of fiscal space, based on the degree of flexibility a government has in its spending choices. This flexibility is determined by examining the historical record of the country's fiscal policy. Fiscal space is defined as the difference between the current

level of public debt and the debt limit implied by the country's historical record of fiscal adjustments.

Summary indicators are perhaps the most utilized approach to analyze sustainability in practice. These indicators are derived from the budget constraint, which determines the evolution of debt as a function of interest rates, the growth rate, and future primary balances. They include the finite horizon tax gap indicator, the infinite horizon tax gap indicator, the financing gap, and the primary gap. The *finite horizon tax gap indicator* describes the evolution of net debt per output, defining a specific time horizon and a debt to output target level to be achieved at the end of the time horizon. This gives the condition for adjustment to primary balance relative to output, dividing the burden equally between generations. The *infinite horizon tax gap indicator* measures the permanent constant adjustment to the primary balance-to-output ratio required to satisfy the inter-temporal budget constraint in an infinite time horizon. This indicator is used by the European Commission. The *financing gap* takes the flow of predicted future primary balances and compares it with the current level of net debt, measuring the adjustment required in present value terms relative to output. The *primary gap* assumes constant future primary balances, and determines the constant primary balance that would satisfy the required infinite or finite horizon sustainability conditions.

A perennial issue with summary indicators of fiscal sustainability is whether to use infinite or finite horizon indicators. Infinite horizon indicators require extreme long-term predictions but finite horizon analyses are very sensitive to the particular debt target that is established (Andersen, 2010). Additionally, the time horizon has to be continually modified, causing changes in the value of the indicator when nothing else changes. Other issues with summary indicators

are that they do not account for interactions between the variables, such as the interactions between the debt level and interest rates. Additionally, these indicators do not explicitly consider uncertainty in their estimations. Most sustainability reports therefore include scenario and sensitivity analyses. Giammarioli et al. (2007) extend some of the indicators they present to account for uncertainty.

Bohn (2005) introduces the Model-Based Sustainability (MBS) criterion. He assumes infinitely-living optimizing credit agents, a government that does not run negative debt in the long run, and complete financial markets. He explicitly includes a stochastic discount factor for contingent claims. The MBS criterion differs from the IBC since the discount rates of future surpluses depend on the distribution of primary surpluses across the states of nature.

Generational accounting, first introduced by Auerbach et al. in 1991, assumes that the fiscal burden is distributed evenly among generations. If most of the fiscal burden is shifted to future generations the policy is unsustainable. The approach disaggregates the surplus of contributions made by different generations and the sustainability of public finances is determined through a comparison of the projected net payments to be made by the new generation to the calculated net payments to be made by future generations. However, similar to the summary indicators, the method does not account for uncertainty and interactions between the variables.

Wright and Grenade (2013) define an optimal debt-to-GDP ratio as one that maximizes economic growth but does not reduce private investment nor increase credit costs. Therefore, social welfare is also maximized. In order to be optimal, the debt must also be sustainable, otherwise that persistent debt would eventually decrease the country´s GDP growth rate.

However, a sustainable debt-to-GDP ratio need not be optimal. A debt may be sustainable, but it may not be maximizing the country's economic growth and social welfare, implying that either a higher or lower debt-to-GDP ratio may be optimal.

Empirical Literature

Time Series Models

Various theoretical frameworks and econometric investigations including unit root and co-integration tests have been proposed to test fiscal sustainability. Deyshappriya (2012) examines long-run fiscal sustainability of both the debt and deficits of Sri Lanka using the theoretical IBC approach. He defines fiscally sustainable policy as one that causes the debt-to-GDP ratio to eventually converge to its initial level, or in other words, the discounted value of future debt converges to zero. The debt series is modeled as a stochastic Auto Regressive Integrated Moving Average (ARIMA) process. To test fiscal sustainability, Dickey Fuller, Augmented Dickey Fuller, and the Phillip Perron unit root tests are employed to assess whether the debt series follows a stationary process. The results indicate that current fiscal policy is unsustainable, since the tests indicate a non-stationary process reflecting unit root process, which indicate that with current policies, the expected discounted value of future debt does not converge to zero. The study determined that the main factors to influence the increase in net debt in 1950-2010 were the GDP growth rate, budget deficit and political instability.

Mahmood and Raouf (2012) use a similar approach to examine debt sustainability in Pakistan during the period 1971-2011. They use the theoretical PVBC approach and two time series tests: unit root tests for the discounted debt series

(exactly like Deyshappriya), but also use co-integration tests between the government expenditure and revenue series, where the presence of co-integration implies sustainability. Both tests are carried out in the presence of structural breaks. Augmented Dickey Fuller and Phillips Perron tests reject the presence of a unit root, therefore also rejecting the stationary hypothesis and implying that public debt does not converge to zero. Then tests are employed to determine the stability of the co-integration vector between expenditure and revenue under structural breaks, which was also rejected. Both tests are consistent in the sense that they imply that fiscal policy was unsustainable in Pakistan during that period.

Bohn (2005) applies unit root tests for real variables unscaled by GDP for the period 1972 to 2003 in the U.S., and finds no credible evidence of unit root tests in the debt-GDP and deficit-GDP ratios. That is, all deficit measures are proven to be stationary. He finds evidence in favour of sustainability since there is a robust positive response of primary surpluses to fluctuations in the debt-to-GDP ratio.

One of the first attempts to test sustainability with the PVBC methodology was carried out by Hamilton and Flavin (1986**)**. They carried out Dickey-Fuller unit root tests to the series of discounted public debt to determine whether the IBC holds in the data for the U.S. during the period 1960-1984, and they find that it does hold.

A limitation with these econometric solvency tests is that they are retrospective; they tell us whether the historical fiscal data can be sustained, but not how shocks to important variables will affect the debt stock, and they do not provide debt thresholds.

Marini and Piergallini (2007) propose that both indicators and tests can be integrated to provide additional information on government solvency issues. Indicators, such as the primary and tax gap indicators, are in a sense forward-looking and provide information on current and future conditions, while tests rely on historical data and are therefore backward looking. Indicators and tests reinforce each other when they provide the same results. In the case of conflicting results, the indicators may signal a change in the policy regime. They advocate testing for structural breaks via the Chow test to determine a break in the fiscal policy regime, and establish that fiscal indicators should be accepted only if this break is found, because otherwise the indicators could simply be reflecting current cyclical factors.

Other models try to estimate debt thresholds in a variety of ways that include estimated growth equations, threshold techniques, and even simple descriptive statistics. Reinhart and Rogoff (2010) imposed a 90 per cent threshold using simple descriptive statistics. Égert (2013) used the Reinhart and Rogoff data set to endogenously identify the thresholds with bivariate threshold models. Cecchetti et al. (2011) specify and estimate a growth equation, derived from Solow's neoclassical growth model but adding various measures of nonfinancial debt to assess their impact on growth. Padoan et al. (2012) combine theory stemming from the negative relationship between debt and growth of the government's IBC to construct a "bad" and "good" equilibrium framework, which is subsequently used to specify and estimate a growth equation. A limitation of some of these studies is that they do not always explicitly consider the differences of income levels between these countries. Debt thresholds vary according to country income for a variety of reasons: they have less developed financial markets, their institutions are frequently less developed, and they have different degrees of openness.

Caner et al. (2010) consider this and use a threshold regression model to estimate the long term average public debt-to-GDP ratios of 101 developed and developing countries, taking into account initial country characteristics such as initial GDP, inflation, and trade openness to differentiate between them.

Multiple Equation Models

Multiple equation models are those in which the dependent variables are determined by the simultaneous interaction of several relationships, or equations, which obey the classical assumptions and each one can be correctly estimated by OLS.

Tanner and Samake (2008) examine the sustainability of fiscal policy under uncertainty in Brazil, Mexico, and Turkey. In contrast to other studies, they make an effort to assess sustainability both retrospectively (based on the historical data) with the Vector Autoregression approach, and prospectively (what policies should be implemented today) with Monte Carlo Simulations, when most emphasize only the retrospective approach.

García and Rigobon (2004) assess the debt sustainability of Brazil from a risk management perspective. They use a debt accumulation equation that includes stochastic correlated variables, such as the stochastic real interest rate, growth rate of GDP, primary deficit, debt shocks, the real exchange rate, and the inflation rate. They propose a VAR model to estimate the correlation pattern of macro variables and use it to implement Monte Carlo Simulations, which allow them to determine that the debt-to-GDP ratio exceeds the threshold of 75 per cent. They also find that even if the debt is sustainable in the absence of risk, there are paths in which it is clearly unsustainable.

Other studies that use these approaches are Croce and Juan-Ramón (2003), Talvi and Vegh (2000) and Blanchard et al. (1990). These authors have estimated the primary surplus necessary to ensure fiscal sustainability. However, they assume full knowledge of certain key variables based on the historical data. That is, they assume that the future path of key variables can be projected utilizing only historical data, without considering the possibility of external shocks. A simple vector autoregression (VAR) model that takes into account industrial production, primary surplus, the real exchange rate, and the real interest rate, is employed to yield the historical decompositions of the sustainability of fiscal policy, that is, whether or not the debt would have risen if certain shocks had not occurred. For the prospective analysis, Monte Carlo Simulations are employed to assess debt sustainability, by determining the probability that debt will rise above their current levels for a certain period of time.

Dynamic Stochastic General Equilibrium Models (DSGE)

This section analyzes studies of public finance sustainability that use general equilibrium models. Using these models is a theoretically accurate way to implement sustainability estimates, since they model the economic structure in detail. The DSGE allows one to capture interactions between the economic variables. The level of effort needed to build such detailed models of economies is tremendous.

Veld et al. (2012) propose a framework for sovereign debt sustainability assessment for Spain based on an estimated DSGE model, which accounts for feedback effects of debt ratios, sovereign spreads and fiscal policies on growth rates and tax bases, and therefore captures the impact of changes in the composition of GDP during fiscal consolidation. The

model is estimated on quarterly data for the period 1995 to 2011, using Bayesian inference methods to estimate parameters and shocks. They then run four Metropolis-Hastings chains to estimate the posterior distribution. Parameters are calibrated to match the main economic aggregates for the period 1995-1999. An analysis of rebalancing scenarios is undertaken based on the model estimates, in order to produce projections for all model variables from 2012 onwards. It is shown that lower growth projections can negatively impact debt projections, but that fiscal consolidation efforts to reduce debt may have short-term costs in terms of growth, but would avoid the costs of higher interest rates.

Sakuragawa and Hosono (2010) investigate the fiscal sustainability of Japan with a DSGE model that incorporates intermediation costs. Specifically, they extend Bohn's (1999) model with financial intermediation costs to a stochastic environment. With the introduction of intermediation costs, they are able to explain the relationship between interest rates and GDP growth rates, since intermediation costs reduce the interest rate and hence the return of a government bond. They find that when the real GDP growth rate is 2.5 per cent, the average real interest rate becomes 2.57 per cent in the presence of significant intermediation costs and the debt-to-GDP ratio gradually increases to become unsustainable. To be sustainable, the primary surplus must be 0.2 per cent of GDP.

Furceri and Mourougane (2009) analyze the effects of fiscal policy on GDP and debt sustainability in the Euro Zone, using a DSGE Fiscal Model with endogenous government bond rates. This study fills a gap in the literature by examining the trade-offs between economic activity and the increase in interest rates when evaluating fiscal policy, since the increase in interest rates may crowd out public investment and

consumption and lead to unsustainable debt levels. In fact, one of the key features of their model is that interest rate on government debt is explicitly modeled as a function of fiscal policy. The simulations show that fiscal policy boosts short-term output, without affecting long-term debt sustainability.

Three other useful studies that have applied the DSGE. Van Ewijk et al. (2006) and Andersen and Pedersen (2006), and Moraga and Vidal (2004). Van Ewijk et al. use a large scale applied general equilibrium model with overlapping generations of households to study ageing and its effect on public finance sustainability in The Netherlands. By constructing a baseline projection that forecasts the evolution of public finances under current policies from 2006 onwards, they find that Dutch public finances are not sustainable in the long run, due primarily to population ageing which leads to significant increases in pension and health care expenditures. Andersen and Pedersen (2006) use a large scale dynamic computable general equilibrium overlapping generation model to study the long-run sustainability of fiscal policy in Denmark. They calculate sustainability indicators with respect to an unchanged policy scenario which represents current policies. They show that in the unchanged policy scenario, expenditure increases faster than revenues, exceeding them around 2020. Moraga and Vidal (2004) investigate fiscal sustainability in a general equilibrium overlapping generation model with endogenous growth resulting from human capital formation. Interest rate and growth rates have a significant effect on long-run sustainability and are determined endogenously in the model. They calibrate the model to the European Union data. They show that the demographic change is not sustainable unless fiscal policies change. Their theoretical specification of the economy allows them to study the impact of various shocks and of fiscal rules.

Standard DSA Analytical Approach

The three main building blocks of the IMF's Debt Sustainability Analysis (DSA) are the one period budget constraint, forecasts, and stress scenarios (IMF, 2002). The framework consists of the analysis of the sustainability of total public debt and of total external debt. It analyzes the current debt structure, vulnerabilities in the structure of the policy framework, and the impact of alternative debt-stabilizing policy paths in cases where difficulties can emerge. It defines public debt as sustainable when the primary balance needed to at least stabilize debt under baseline and stress scenarios is economically and politically feasible, such that debt is consistent with an acceptably low rollover risk and with preserving healthy growth.

The framework estimates a baseline scenario based on macroeconomic projections, intended policies, assumptions, and then sensitivity analyses are applied to this baseline scenario, which provides a probabilistic upper bound for the debt paths. These debt paths under the baseline scenarios and under stress tests allow policymakers to determine a country's vulnerability to a crisis. However, DSA results must be assessed in the context of relevant country-specific circumstances. Therefore, two types of frameworks were designed, those for market-access countries (i.e. countries with access to international capital markets) and those for low-income countries. A Staff Guidance Note in May 2013 improves DSA for market access countries under high scrutiny through more realism of baseline assumptions, identification of risks associated with the debt profile, analysis of macro-fiscal risks, analysis of vulnerabilities related to the level of public debt, and coverage of fiscal and public aggregates.

To increase the realism of the baseline assumptions, the growth assumptions of booming countries are compared to the historical experience of boom-bust cases. They define as a boom when the output gap has been positive for three consecutive years or when the three-year cumulative change in credit to GDP ratio exceeds 15 per cent for emerging markets and 30 per cent for advanced countries. A positive growth rate that is not above this threshold may be considered acceptable. The main macro-fiscal risks that the Note establishes are shocks that cause primary balance deterioration, real GDP growth rate reduction, nominal interest rates increase, real exchange rate overvaluations, and the interactions between these variables. Some of the stress tests involve the impact of these macro-fiscal risks on debt profile indicators, such as the debt-to-GDP ratio and the gross financing needs to GDP ratio, which reflect solvency and liquidity, respectively.

The revised framework also takes into account contingent liabilities, such as explicit or implicit guarantees to banks or other entities. The DSA framework for low-income countries follows the same general principles, but also considers the fact that these countries obtain external financial resources mostly through concessions. Caribbean countries classified as low-income include Dominica, Grenada, Guyana, and St. Lucia. The DSA for low-income countries aims to guide these countries' borrowing decisions in a way that matches their funding needs so that they can service their debt. In each case, the framework is applied to the country's specific circumstances. The framework attempts to ensure that the concessional resources that are provided by creditors and donors are provided in a way that is consistent with long term fiscal sustainability.

However, the DSA does have some weaknesses. It does not elaborate on what is politically feasible, it does not distinguish between the ability and willingness to pay, does not explicitly define rollover risk, and provides no criteria for establishing how long the historical period should be to produce forecasts. Additionally, no sensitivity analysis has been conducted on the methodology itself.

Within the Eastern Caribbean Currency Union (ECCU), the IMF has continually carried out DSA analyses for Dominica, Grenada, St. Lucia, and St. Vincent and the Grenadines. In their latest assessments, they determine that St. Vincent and the Grenadines (2011) public debt remains on a sustainable trajectory over the medium term and external debt distress remains moderate, with a public debt-to-GDP ratio of 52 per cent by 2021, due the authorities' adoption of fiscal consolidation measures. For Grenada (2010) the IMF determines that Grenada's debt distress risk is high under the baseline projections, that Grenada exceeds the ratio of the present value of external debt to GDP and to exports, and the debt service to exports ratio. Grenada has to achieve a primary surplus of around two per cent of GDP in the medium-term to achieve the ECCU benchmark of reducing the public debt-to-GDP ratio to 60 per cent by 2020. For Dominica (2012), improvement in public spending management is needed to reverse the upward debt trajectory to achieve the ECCU target of 60 per cent by 2020. For Guyana (2011), debt distress risk remains moderate, since authorities are still committed to fiscal consolidation and structural reforms, which would facilitate a stronger growth rate. For St. Lucia (2010) the baseline scenario indicates that debt will remain sustainable in the medium term, unless external shocks such as natural disasters occur and assuming successful fiscal consolidation occurs, which requires a primary surplus of 2.0 per cent of GDP in the medium term.

Kawakami and Romeu (2011) extend a basic stochastic debt forecasting algorithm for Brazil to capture feedback from fiscal policy in its forecasting projections, capturing the second-round effects of fiscal policy. First, the primary balance is modeled as a function of past debt-to-GPD ratio and other fundamentals, and a fiscal reaction function is estimated to produce the distribution of fiscal reaction function coefficients. Second, a restricted VAR is used to simulate economic scenarios by combining the lagged macroeconomic coefficients with the distribution of the estimated VAR coefficients. Third, a debt motion equation is simulated that links the two blocks and incorporates uncertainty. The evidence suggests that second-round effects are important.

Hadjenberg and Romeu (2010) extend the probabilistic DSA to explicitly consider parameter estimation errors in the debt projection algorithm, which illustrates the uncertainty resulting from the volatility of debt determinants and the inaccuracy of parameter estimates. The revised framework is applied to Uruguay, by employing a restricted VAR and a country-specific fiscal reaction function. The improved specification of the econometric model reduces the variance of debt projections, and therefore more precise estimates of economic variables and fiscal policy reaction function delivers a more accurate debt forecast and sustainability analysis.

Frank and Ley (2009) allow for structural breaks in the VAR model for macroeconomic variables. Additionally, in the Monte-Carlo simulations they draw from the empirical distribution of shocks instead of drawing from a normal distribution, which allows for asymmetries. Finally, they obviate the need for a reaction function by focusing on destabilizing balances when producing baseline projections.

This specification serves as a sensible reference when examining debt and fiscal sustainability.

Focus Studies for the Caribbean

Wright and Grenade (2013) estimate the optimal debt-to-GDP ratio for selected Caribbean countries, comparing those against the actual ratios through calibration. The study employs a debt-growth model by using panel dynamic ordinary least squares, a threshold debt model to estimate the debt-to-GDP ratio above which debt negatively impacts economic growth, and a modified Blanchard model to determine the optimal debt levels for the individual countries. It was determined that Grenada, Jamaica, and St. Kitts and Nevis have debt levels above the optimal, and those of Antigua and Barbuda and Barbados increased above the optimal level after the financial crisis of 2008. They find that debt negatively affects economic growth for the Caribbean region after a debt-to-GDP ratio of 61 per cent is reached. A weakness of the study is that it does not explicitly include debt service payments, which in many Caribbean countries are substantial. Additionally, since the optimal debt levels for individual countries are estimated, the debt threshold of 61 per cent for all the Caribbean countries may not be of that much use for policymakers.

Greenidge et al. (2012) use a threshold least square regression which is modified to include a dummy variable to study the threshold effects between public debt and growth in the CARICOM[2] countries from 1980 to 2010. They determine at

[2] Includes Antigua and Barbuda, The Bahamas, Barbados, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago.

a threshold debt-to-GDP of 55-56 per cent, debt increases negatively affect economic growth. However, they find that dynamics change below this threshold. At debt-to-GDP ratios below 30 per cent, an increase in the ratio is correlated with more growth. However, at ratios above 30 per cent, the positive effects on growth rapidly decrease, and beyond 55-56 per cent of GDP, it affects growth in a negative way. A limitation of this study is that the thresholds that are found apply to the average of the CARICOM countries, but it may not be true for any individual country of the sample. For example, the threshold for Grenada may be above or below 55-56 per cent, so it is not easy to extrapolate policy conclusions for individual countries based on the results. Additionally, when changing debt/GDP thresholds the results are not significant, and the study does not consider the possible effects of debt servicing and total factor productivity when studying the debt-growth relationship.

The findings of Acevedo and Thacker (2010) for the ECCU countries are in line with those of Greenidge et al. (2012). They find that debt increases in these countries have significantly constrained economic growth. Specifically, they find evidence that shows debt-to-GDP ratios above 30 per cent reduce growth, and debt-to-GDP ratios above 60 per cent negatively impact growth. They also find evidence of crowding out, as government spending seems to have decreased private investment.

Grenade (2011) examines the fiscal sustainability of Barbados, Jamaica, and St. Kitts and Nevis, all of which had public debt-to-GDP ratios that exceeded 100 per cent at the end of 2010. She builds on Sahay (2005) by exploring the scale of fiscal adjustment required to achieve sustainability. This was done with the accounting approach, which, given its simplicity and manageability, lends itself easily to use. The

accounting approach underpins the primary gap indicator, the debt-stabilizing primary surplus ratio under finite horizon, the debt-reducing primary surplus under finite horizon, and the fiscal sustainability or convergence indicator. The analysis is based on each country's debt ratio and primary balance to GDP ratio at the end of 2010 and the medium-run assumptions of macroeconomic aggregates, which are used to construct baseline, optimistic, and pessimistic scenarios. The main finding is that medium-term fiscal sustainability was at risk in these countries, but more so in Barbados and St. Kitts and Nevis, and therefore large-scale fiscal adjustments were needed to put these countries on a sustainable path. Although the accounting approach is simple and intuitively appealing, it does have some weaknesses. First, it is assumed that liabilities can grow at the rate of GDP, therefore ignoring the potential role that creditors can play in determining sustainable policies. Second, in one of the indicators that underlines the approach, the primary gap indicator, cyclical variations and unrealistic medium term assumptions can easily distort the estimate of the required fiscal adjustment. In this regard, a probabilistic approach can sometimes be more useful to estimate future sustainability, since it projects the likelihood of achieving a sustainable debt ratio and therefore the probability of success in fiscal adjustment.

Craigwell, Wright, and Ramjeesingh (2009) use both co-integration and primary gap indicators to determine Jamaica's fiscal sustainability conditions for the period 1999 to 2008. In contrast to previous studies, this one complements the co-integration analysis with primary gap indicators. First, the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests are applied to government expenditure to GDP ratios and revenue to GDP ratios, which indicated that both series are stationary and have a long run trend. Then the Johansen unrestricted co-integration test was applied,

supplemented with the Engle-Granger two-step approach to analyze the residuals for unit roots and possible variable co-integration, finding that both the revenue and expenditure to GDP ratios are co-integrated and therefore trend together towards a long term equilibrium, indicating that the country's debt position is sustainable, and the primary gap indicators support this conclusion. The fact that this study uses the primary gap indicator exposes it to the same weakness of the Grenade (2011) study: the primary gap indicator is very sensitive to cyclical variations, which can affect future projections. Additionally, the co-integration tests employed are retrospective, they tell us that Jamaica's fiscal policy *was* sustainable during the period 1999 to 2008, but they do not necessarily offer any guidance as to whether fiscal policy will remain on a sustainable path in the near future. Moreover, co-integration tests frequently require long data sets in order to be valid. According to Kennedy (2008), in order to be sufficiently robust, Johansen co-integration tests require a sample size of about 300, and this study uses 37 observations.

Branch and Adderley (2009) use the calibration technique on static equations to compute both the fiscal and debt sustainable ratios for The Bahamas. To find the sustainable fiscal-to-GDP ratio, they calibrate the variables of central bank financing, the forecasted nominal growth rate, the debt-to-GDP ratio, and the inflation rate for the period 1985 to 2005, and the results indicate that a primary deficit of 3.2 per cent of GDP is necessary to achieve fiscal sustainability. To compute the sustainable debt-to-GDP ratio, they use data for the period 1984-2005 in the modified version of the Blanchard and Fischer (1993) model with the modification that Fraser (1999) introduced, using the primary deficit, the change in central bank financing of Government deficit, the real interest rate, and the nominal GDP, and find that the debt-to-GDP ratio at that time is sustainable. A weakness of this

study is that no sensitivity analysis is undertaken to observe how the results change when varying the parameters. Whenever calibration is utilized, there is great uncertainty regarding the parameters used, and significant analysis must be undertaken to justify their values, frequently referring to past studies in which they are used and justifying their intuitive nature. This brings us to another weakness of the study: the use of the parameter values is not thoroughly justified, since the use of certain values when defining parameters is not explained.

Scott-Joseph (2008) aims to determine the most suitable approach for assessing debt sustainability in the Caribbean. She finds that the most suitable methodologies for determining fiscal sustainability in the Caribbean are the primary gap indicators and the econometric approaches. The argument stems from the fact that primary gap indicators signal the timing and size of the adjustment needed, and that they are not complex and therefore may be used easily by governments when implementing fiscal policy. The econometric approach, which consists of unit root tests (e.g. Augmented Dickey Fuller, Phillips-Perron) and co-integrating tests, permits the utilization of quantitative techniques to support macroeconomic theory. Scott-Joseph used both co-integration and PVBC approaches to analyze sustainability in Dominica, Jamaica, St. Kitts and Nevis and St. Vincent and the Grenadines. Similar to Craigwell, Wright, and Ramjeesingh (2009), she concludes that public debt was sustainable only in Jamaica. A weakness of this study is that it uses the primary gap in a retrospective approach; to calculate the gap between the periods of study. In another study, this indicator has been used with a more forward looking approach, to estimate medium term fiscal sustainability. Another weakness is that by definition, the PVBC approach

assumes that parameters are fixed over time, which may not necessarily be true.

Sahay (2005) examines fiscal sustainability using the accounting approach in the most indebted Caribbean countries: Antigua and Barbuda, Belize, Dominica, Grenada, Jamaica, and St. Kitts and Nevis, all of which had a public debt-to-GDP ratio above 90 per cent at the end of 2003. Specifically, she aims to determine the magnitude of the primary balance needed to reduce public debt ratios to 60 per cent of GDP in five years and what the ratio of public debt to GDP will be in 2008. The main finding is that large primary surpluses were required for debt reduction ranging from 23.1 per cent to four per cent of GDP. Therefore, fiscal consolidation is critical to reduce public debt to sustainable levels. The main weakness of this paper is its assumption that the 60 per cent debt-to-GDP ratio is optimal, in the absence of any empirical test.

Archibald and Greenidge (2003) examine the sustainability of Barbados' policies regarding the financing of public expenditure and debt management after the country's independence, the period 1976-2001. They follow the accounting approach and the PVBC approach, and with the latter they carry out Augmented Dickey-Fuller (ADF) unit root tests and the Johansen and Johansen co-integration test of expenditure and revenues, using both fixed and time varying coefficients. Archibald and Greenidge concluded that fiscal policy in Barbados is sustainable due to prudent fiscal policies. This conclusion was supported by Belgrave et al. (2011), who find that Barbados' fiscal deficit had been on a sustainable path since 1993, and remained so despite the rise in debt-to-GDP ratios after the financial crisis. An interesting feature of this study is that it addresses the weakness of the PVBC approach that assumes fixed parameters, by

remodeling co-integration equation as a Time Varying Coefficient Model. Although in this case the results were similar to the fixed coefficient model, it is an innovative feature that may be used in studies to see if there are any variations when the fixed parameter assumption is relaxed.

Kufa, Pellechio and Rizavi (2003) examine the sustainability of public debt using the public sector budget constraint to derive the maximum public debt-to-GDP ratio that can be sustained based on a country´s projected steady-state primary balance, interest rate on public debt, and economic growth rate. According to this framework, the government deficits and debt in Antigua and Barbuda, Dominica, and St. Kitts and Nevis appeared unsustainable and represented a risk to the stability of the Currency Union. The high public debt-to-GDP ratios in Grenada and St. Vincent and the Grenadines were found to be concerning but did not pose a great threat.

Summary

The literature review gathered the most important theoretical and empirical studies related to debt and fiscal sustainability. First, the main theoretical literature was discussed. We began by distinguishing between the concepts of solvency and liquidity, elaborating on how the IMF and other sources define these interrelated concepts. We then explained how the IMF defines sustainability and its relationship to solvency and liquidity. Afterwards, five theoretical frameworks were presented and explained: fiscal limits and debt ceilings, summary indicators, Model-Based Sustainability, Inter-Temporal Budget Constraint, and Generational Accounting, explaining their main theoretical underpinnings and why they may not be consistent with each other. The empirical literature reviewed different econometric approaches that have been used to study fiscal sustainability. The Time Series Models

section examined studies that have used co-integration tests, unit roots, and threshold regression models to assess sustainability. The Multiple Equation Models mainly examined Vector Auto Regression models that have been used. The Dynamic Stochastic General Equilibrium Models section examined variations of DSGE models that have been used to assess sustainability, which includes the inclusion of sovereign spreads, financial intermediation costs, endogenous government bond rates, and overlapping generations of households. The DSA section analyzed the main theoretical and empirical underpinnings of the IMF framework and also examined other studies that have applied this framework. Finally, a section was included to analyze specific sustainability studies undertaken for the Caribbean, in which debt growth models, threshold models, co-integration tests, summary indicators, and calibration techniques have been used.

The literature review uncovered varying definitions for sustainability resulting in seemingly contradicting conclusions and policy implications. Some commonly used tools, including the IMF's influential debt sustainability analysis, do not distinguish between sustainability and optimality, and none of the established methodologies provides an objective measure of a threshold beyond which fiscal policy and debt become unsustainable. The available methodologies use a variety of incompatible approaches, and depend on a large number of assumptions, including the choice of time horizon for the assessment, the rate of discount, and the effects of tax policy on growth. The studies reviewed include those that depend on ill-defined concepts, such as "fiscal space", and others such as the output gap which are difficult to measure objectively in economies which are growing in a world where tastes and technology are among the main drivers.

Inter-temporal Budget Constraint Approach

This approach starts with the government's budget constraint in real terms P, as follows:

$$B_{t-1} = \frac{B_t}{1+r_t} + \frac{PS_t}{1+r_t} \quad (1)$$

We iterate 1 forward N periods and assume constant real interest rates, so the inter-temporal budget constraint becomes:

$$B_{t-1} = \sum_{j=0}^{N} \frac{PS_{t+j}}{(1+r)^{j+1}} + \frac{B_{t+N}}{(1+r)^{t+N}} \quad (2)$$

Assuming that the present value of government debt in the indefinite future converges to zero, then in the limit, the second term in 2 is to zero (i.e. the government does not run a Ponzi scheme), so that at any point in time, the government debt must equal the present value of future primary surpluses. The assumption that the government will not run a Ponzi scheme is feasible since it is hard to believe that lenders would allow a government to indefinitely pay all its interest obligations through increased borrowing. The inter-temporal budget constraint therefore becomes:

$$B_{t-1} = \sum_{j=0}^{N} \frac{PS_{t+j}}{(1+r)^{j+1}} \quad (3)$$

Chapter 3

Fiscal Deficits and Debt in the Caribbean

Introduction

The public finances of the countries of CARICOM and the Dutch Caribbean (the countries covered in this research) have all weakened over the past decade or more. This tendency predated the 2008 global recession, but the pervasiveness and magnitude of that event severely worsened the circumstances of all countries. However, the countries have escaped fiscal, financial or balance of payments crises in the post-recession period, with the exception of St Kitts and Nevis and Grenada. Together these crisis-hit countries account for no more than 3.24 per cent of total GDP of CARICOM and the Dutch Caribbean. Both St Kitts and Grenada rescheduled government debt as part of an overall adjustment programme. In addition, there were two countries which did not experience a crisis, but nevertheless negotiated debt restructuring, in order to contain public expenditure. Jamaica exchanged outstanding local bonds for obligations at longer term and lower (but still market-competitive) interest rates on two occasions, and Belize restructured its largest foreign debt, also with interest and maturity adjustment, but with a small haircut on principal. The proportion of external debt of CARICOM and the Dutch Caribbean that has been affected by these four operations amounts to 6.67 per cent, and the proportion of regional domestic debt represented by the restructured Jamaican debt is about one third.

The trajectory of public debt prior to 2008.

Governments of the countries covered by this study have all struggled to contain fiscal deficits over the past four decades or more. This is partly a reflection of expansion in the coverage and quality of physical infrastructure and public utilities, and the delivery of health, education and other public services. This helps to account for the improvement manifested in the human development index since 1980 for all countries. Additional pressure on spending has derived from demand for job creation in the public sector, to help to relieve the burden of stubbornly high levels of unemployment.

A third factor animating public sector finances has been Governments' initiatives to spur economic development. Investment in infrastructure (roads, ports and airports) made for improved competitiveness, but the benefits of other initiatives are less clear. Many of these incentives were by way of tax concessions; they are a fact of international commerce, so all countries are constrained to offer such incentives. However, because these incentives are universal, there is no marginal advantage to them, at the same time that the cost of not having them is prohibitive. (If all others are offering incentives, potential investors simply walk away from any country that doesn't offer them.) All countries have employed a wide variety of direct efforts to accelerate the pace of economic development, via financing, marketing and promotion, and equity participation in commercial ventures. These have usually been controversial, and many financial institutions and companies created for these purposes have now been liquidated.

Tax revenues have struggled, and largely failed, to keep up with perceived government spending priorities. This led to the emergence of fiscal and balance of payments crises in Jamaica

and Guyana in the 1970s, and in Trinidad and Tobago and Suriname in the early 1980s. Barbados, Belize, and some ECCU countries contained fiscal pressures sufficiently to avoid threat of crisis at that time. Countries of the ECCU and the Dutch Caribbean benefitted from grants, transfers and concessional finance from Canada, the UK, the Netherlands, the US, the CDB, IDB, World Bank and other national and multinational sources, which contributed significantly to closing the gap between revenues and expenditures.[3]

In the last three decades, since the difficulties of the early 1980s, the Caribbean has avoided balance of payments crises. Barbados averted a crisis in the early 1990s by pursuing a vigorous fiscal contraction strategy. This was appropriate, because the proximate cause of the balance of payments pressure was a loss of investor confidence after a series of expansionary fiscal deficits financed by central bank lending. Jamaica suffered the largest financial crisis the Caribbean has so far witnessed in the second half of the 1990s, but there was no noticeable effect of the financial crisis or its resolution on the real economy or the balance of payments.

Over time the fiscal support for ECCU countries from external sources has diminished, and it has been a challenge to reduce deficits and secure adequate financing. There have been ongoing efforts to boost government revenues, with the re-introduction of the income tax in Antigua and Barbuda, and the introduction of value-added taxes in some countries. Nonetheless, there were several debt defaults and restructurings in the ECCU before the onset of the 2008 recession. Dominica negotiated a restructuring of US dollar debt in 2004; Grenada secured a restructured settlement

[3] And, in the case of Aruba, debt forgiveness in 2003 helped to bring down the debt-to-GDP ratio.

through the agency of the Paris Club in 2005; Antigua and Barbuda rescheduled external debt in 2006, and in 2007 an Italian bank wrote off a loan to the St Vincent government for an unsuccessful yacht servicing facility at Ottley Hall. None of these caused financial or balance of payments distress for the ECCU as a whole.

In Guyana and Jamaica, burgeoning fiscal deficits in the 1970s precipitated balance of payments disequilibria with which the countries struggled for more than a decade. Boosted by fiscal expansion, the demand for imports exceeded foreign exchange inflows, and foreign reserves were depleted. In Guyana, the foreign exchange outflow was aggravated by compensation paid to overseas owners of commercial assets taken into state ownership, including the production of sugar and bauxite. The relentless exchange market pressure triggered large capital flight, and the supply of foreign exchange on the formal financial markets largely evaporated. After more than a decade of experiments with a variety of exchange regimes, both Jamaica and Guyana abandoned the exchange rate anchor in the 1990s.

Of the two countries, Guyana was the one where the external debt could not be fully serviced. Guyana was a beneficiary of the IMF-World Bank programme for debt relief for Highly Indebted Poor Countries (HIPC). As a result of freezing external debt obligations under the HIPC arrangements, and the exceptionally high inflation levels in Guyana as the exchange rate depreciated from about 50 US cents to 1/2 of a US cent, Guyana is now among the region's least indebted nations, in relation to GDP. However, over the same period the country's economic development has lagged badly, compared with The Bahamas, Barbados, Belize and the ECCU.

In all, these fiscal currents over the decades leading up to the Great Recession of 2008 had left the countries of CARICOM and the Dutch Caribbean with a challenge for fiscal containment that was serious but manageable. At the end of 2013 the aggregate debt-to-GDP ratio for the group was about 98 per cent; that figure is not informative, as this study demonstrates. What does matter for sustainability is the ratio of external debt service to foreign exchange earnings, which was approximately 16[4] per cent. The fact that the foreign currency reserve cover was about 16[5] weeks suggests that the Caribbean as a whole does have a sustainable fiscal strategy.

Comparisons among countries since the onset of the 2008 global recession.

The onset of the global recession found most Caribbean countries with little scope for countercyclical policies. This was because avenues for attracting foreign capital inflows turned out to be limited for several reasons. (In the Caribbean, fiscal stimulus has to be funded by foreign finance to provide the foreign exchange needed to buy the additional imports that result from the stimulus.) The global recession depressed tourism demand, and consequently the attractiveness of investment in tourism. The collapse of the real estate bubbles in the UK and elsewhere depressed the demand for vacation homes in the eastern Caribbean, and the inflow of foreign finance associated with those purchases. Some foreign financial institutions fell into insolvency on the eve of initiating projects in the Caribbean, and the projects have struggled to find alternative sources of funding. Some countries lacked access to international capital markets, and

[4] Data for all countries was only available for 2010.
[5] Removing Trinidad and Tobago, the foreign currency reserve cover was 13.3 weeks at the end of 2013.

those that did have access found the costs of borrowing were often prohibitive. In addition, it proved impossible to accelerate Government projects for which foreign funding had already been secured.

Deliberate countercyclical fiscal policy, in the absence of additional inflows on the long term capital and financing account, causes a deterioration of external payments for any Caribbean country. Any such attempt, in the face of declining inflows from exports, tourism and international business, causes serious erosion of levels of foreign exchange reserves. The fact that foreign exchange reserve levels have been sustained across the region since 2008 is *prima facie* evidence of the absence of countercyclical fiscal policy since the onset of the global recession.

Maintenance of adequate foreign exchange reserves has protected Caribbean countries from balance of payments crises in the wake of the 2008 recession. However, there have been some scares, because of weakening government finances. Government revenues have weakened in most countries because of worsening unemployment, reduced profitability and lower consumer spending, which affected taxes on income and spending. Containment of Government expenditures proved a challenge, because of rising import prices of fuels and other supplies, increases in unemployment compensation and social support, and the cost of servicing a sharply wider fiscal deficit.

The situation was especially acute in many countries because of an inherited overhang of expensively-financed, poorly designed projects, very high real interest rates, low levels of productivity in the public service, and structural issues related to tax policy and the organisation and management of public services.

In all countries except Aruba the centrepiece of economic adjustment strategy in the wake of the 2008 global recession was fiscal consolidation and a reduction in the fiscal deficit. In the cases of Jamaica and St Kitts and Nevis, the adjustment programme was supported by an IMF financing programme. The IMF assisted the authorities in Jamaica with the two debt exchanges and the Fund continues to assist St Kitts and Nevis with negotiations with its creditors for the resolution of debt on which the country has defaulted. However, the Fund has clarified that, while there may be circumstances in which Fund programmes will respect authorities' decisions to restructure debt, the Fund always advises countries to honour their obligations in full (IMF, 2014). The Belizean authorities failed to secure Fund support for their debt restructuring initiative in 2012.

Fiscal policy and the balance of payments.

It is noteworthy that full blown economic crises in the Caribbean were always associated with external imbalances, excess of demand for foreign exchange over the available supply, and exhaustion of the foreign exchange reserves of the central bank. In Guyana, Suriname and Jamaica the prolonged balance of payments difficulties, lasting from the late 1970s to the early 1990s, caused their economies to lose ground in terms of economic development relative to the rest of the Caribbean (UNDP, 2013). Barbados, which took appropriate fiscal action to restore balance of payments stability in 1991/2, avoided a balance of payments crisis, and maintained its development advantage. So long as the balance of external payments was not affected, countries were able to cope successfully with major fiscal, financial and structural economic changes, with only minor pauses on the upward path of economic development. Jamaica was the most outstanding example of this, with a financial rescue package

in the late 1990s that amounted to 30 per cent of GDP by some estimates[6]. However, there was no impact on the balance of payments or the growth of the economy. A current example of seamless financial restructuring that has no adverse effects on the real economy is the Trinidad and Tobago Government resolution programme for a dominant financial conglomerate.

The Caribbean offers, in addition, examples of remarkable transformation of economic production bases, effected without interrupting growth, because there was no excessive pressure on foreign exchange markets. The economies of OECS countries have been largely transformed from an agricultural export base to focus on tourism as the main foreign exchange earner, beginning in the 1970s with Antigua and Barbuda, and continuing through the 1980s and 1990s.

Countries that avoided balance of payments crises advanced in the development rankings, notwithstanding fiscal challenges and rising debt levels. This is a manifestation of the fact that foreign exchange is the binding constraint in the open economy, and that economic strategies are feasible so long as they respect that constraint.

The Caribbean experience also offers an example of devaluation in the service of fiscal adjustment. The Trinidad and Tobago dollar has been devalued on three occasions, each time with a substantial fiscal benefit. Because the largest percentage of Trinidad and Tobago Government revenue comes from energy-based exporters and is received in foreign exchange, a devaluation immediately improves the fiscal balance in Trinidad and Tobago in the proportion of the

[6] IMF, 'Jamaica - selected issues,' Country Report no. SM/98/166, Rev 1, Oct 29, 1998.

devaluation. In this respect Trinidad and Tobago is unique; no other country derives the overwhelming percentage of its revenue from a single foreign exchange earning sector. In Trinidad and Tobago's case, the apparent fiscal benefit has to be weighed against the inflation induced by the devaluations, and the cost-benefit of alternative action to reduce the fiscal deficit by an equivalent amount.

The Caribbean provides evidence in support of the widely observed coincidence of financial and balance of payments crises. This is a reflection of the small domestic market size, limited diversification possibilities, and lack of competitive import substitutes. In economies of this kind, fiscal, financial and economic policies become unsustainable when they come up against the balance of payments constraint. So long as that restraint is respected, very large programmes may be effected successfully, both in the real and financial economies.

Country experiences – countries that have never restructured debt

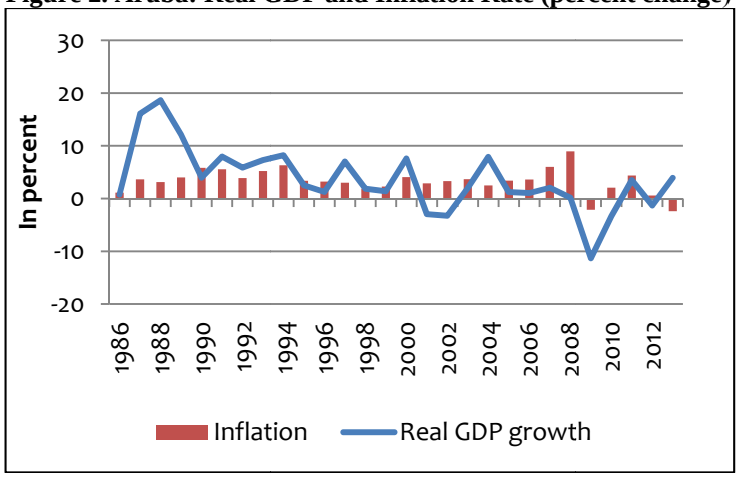
Aruba

In recent years Aruba has struggled to contain government deficits and the growth of debt. The country started with moderate debt-to-GDP ratios at the onset of the 2008 international recession, but the ratio has increased to 74 per cent of GDP in 2013.

In January 1986, Aruba seceded from the Netherlands Antilles and obtained an autonomous status (i.e., *Status Aparte*) within the Kingdom of the Netherlands. The oil refinery, which was the main economic pillar for close to 60 years, terminated its operations in early 1985. Aided by fiscal incentives, tourism emerged as the new backbone of Aruba's economy. An investment boom in the late 1980s and the early 1990s more

than doubled the hotel room inventory, resulting in double-digit growth rates in the real GDP, accompanied by increasing inflation rates to somewhat above five per cent in the early 1990s (see Chart 1). Although the oil refinery reopened in 1990, its economic impact was much less than prior to 1985 due to the smaller scale of its operations; this industry became the second economic pillar in Aruba (after tourism).

Figure 2. Aruba: Real GDP and Inflation Rate (percent change)



Source: Central Bank of Aruba.

Following a leveling off of the investments in the hotel sector by 1991, economic growth subsided in the years 1992-2000, while the average annual inflation fell back to somewhat below four per cent. In the years 2001-2002, Aruba experienced its first economic recession after slightly more than 15 years. In 2003, Aruba's economy started to recover from this economic downturn, expanding by on average 2.4 per cent in the years 2003-2008. The average annual inflation rate in this period edged up to 4.7 per cent, associated with the introduction of a turnover tax in 2007, and higher oil and food prices. In 2008, the repercussions of the international

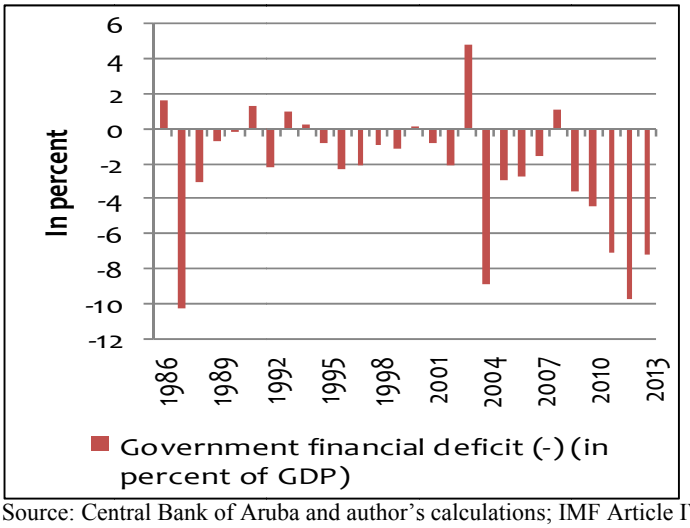
economic and financial crisis brought the Aruban economy almost to a standstill. In addition, the oil refinery ceased operations between mid-July 2009 and end-2010, resuming again in 2011, and terminating its activities in March 2012. Between 2008 and 2013, real output fell by a cumulative 12.4 per cent. In 2013, real output was still nine per cent below the level of 2008. The annual inflation rate averaged 0.5 per cent in the period 2009-2013.

Fiscal performance

Since 1986, the government of Aruba has generally recorded deficits, with some exceptions related largely to incidental revenues. In the late 1980s and the early 1990s, the government of Aruba used expansionary fiscal policy to stimulate the economy and maintained a historically high level of capital expenditure. In the following years, increasing interest expenses, a rising public sector wage bill and the introduction of a general health insurance in 2001 contributed to persistent fiscal deficits. In addition, the halving of the turnover tax rate in 2010 as well as lower government revenues related to the economic slowdown after 2008 led to a further deterioration in government finances. Government financial deficits rose to on average eight per cent of GDP in the period 2011-2013 (see Chart 2), despite reforms in the health care and the pension systems.

Until the mid-1990s, somewhat less than 60 per cent of total government debt was financed externally (see Chart 3). This share has decreased over the years to about 48 per cent in 2013, reflecting the aim of the government to shift its composition of debt to domestically financed. At the end of 2013, government debt amounted to US$ 1.9 billion (73.6 per cent of GDP).

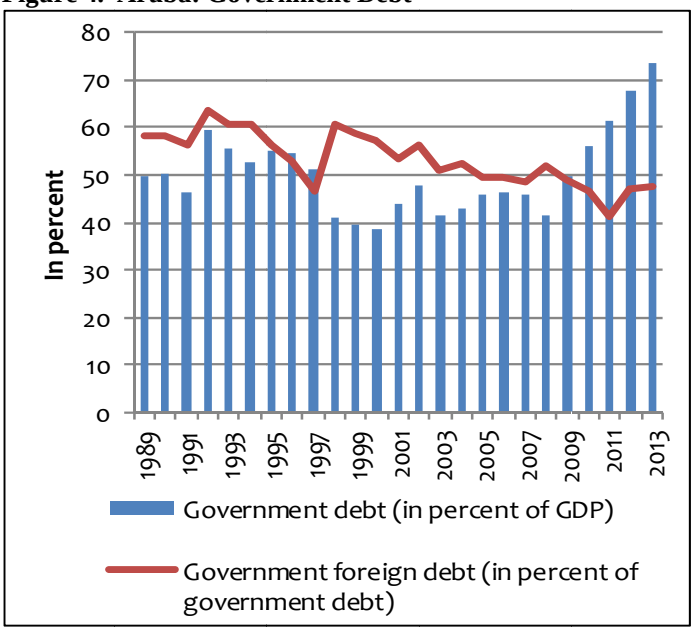
Figure 3. Aruba: Financial Deficit on a Cash Basis [1)]



Source: Central Bank of Aruba and author's calculations; IMF Article IV reports.

1) The financial deficits of the period 1986-1994 are based on various reports of IMF Article IV Consultation and exclude the (US$ 146 million) debt assumption in 1992 (and related interest accumulation between 1992 and 2003) related to the hotel guarantees issued by the government in the 1980s.

Figure 4. Aruba: Government Debt



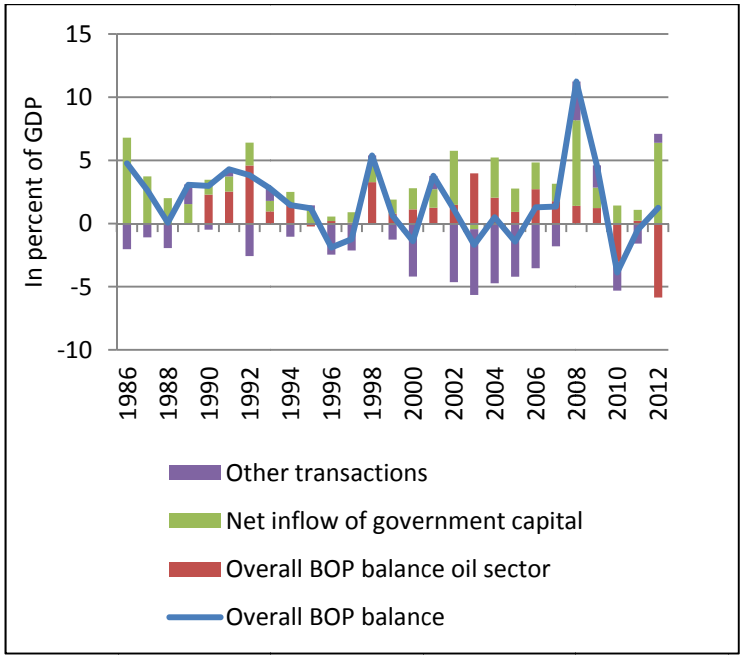
Source: Central Bank of Aruba and author's calculations; IMF Article IV reports.

Balance of payments

Since 1986, the balance of payments of Aruba has been influenced largely by the external transactions of the oil sector. For the most part, the oil sector had financed its own external transactions as reflected by the positive overall surpluses of this sector (see Chart 4). Nevertheless, as a result of the shutdown of the oil refinery between mid-July 2009 and end-2010 and since March 2012, the external transactions of this sector resulted in a net outflow of foreign funds related to the imports of oil products for domestic use. The net government capital inflow, comprising mainly external

borrowings, contributed to the overall surpluses on the balance of payments.

Figure 5. Overall Balance of the Balance of Payments (BOP) of Aruba



Source: Central Bank of Aruba.

Current account balance

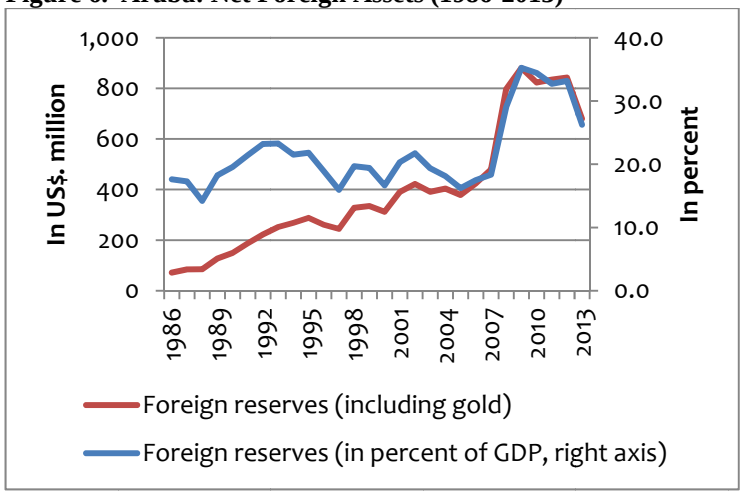
Aruba experienced large swings in its current account balance over the years, related mostly to developments in the oil sector. In general, the oil sector posted current account surpluses prior to the shutdown of its operations in the period 2009-2012, reflecting the net export receipts of this sector. In contrast, the nonoil sector had registered persistent current account deficits over the years in spite of the strong tourism

sector, partly because Aruba is a small open economy largely dependent on merchandise imports due to its limited domestic production of goods.

Net international reserves position

The net international reserves of Aruba increased from 17.6 per cent of GDP in 1986 to 26.2 per cent in 2013 (see Chart 5). In 2008, the level of net international reserves rose markedly as a result of an incidental receipt of the proceeds from the sale of the Plant Hotel and a buoyant tourism performance. Since 2010, these reserves have been under pressure as reflected in a downward trend in the merchandise import coverage ratio and the current account payments coverage ratio. However, the reserve level is still adequate, taking into account the merchandise import coverage ratio of almost seven months and the current account coverage ratio of 3.5 months at end-2013.

Figure 6. Aruba: Net Foreign Assets (1986-2013)



Source: Central Bank of Aruba.

The Bahamas

The Bahamas fiscal deficit widened after 2008 because revenue weakened and expenditure was not contained. However the deficit remained below 7 per cent of GDP even in the worst year, and debt-to-GDP ratios remain below 60 per cent.

The Bahamas, like many countries within the region, has in recent years encountered challenges in containing the expansion of its official debt. Following the global recession in 2008, tax revenues fell, while Government spending rose to provide some stimulus to the economy and support to vulnerable groups affected by the recession. Real output in The Bahamas, which is mainly sustained by tourism, fell by 2.3 per cent in 2008, and contracted further by 4.2 per cent in the next year. Although the economy began to recover in 2010, growth remained lethargic at 1.7 per cent and 1.8 per cent in 2011 and 2012 respectively (chart 1). Unemployment continued to be elevated at 14.7 per cent during 2012, albeit an improvement from the 15.9 per cent noted in 2011. However, with the majority of goods consumed imported from the United States, inflation has been relatively low and stable averaging 2.6 per cent over the 2008-2012 period (Table 1) .

Government increased social spending to offer aid to the unemployed or underemployed, and broadened capital spending on infrastructure projects that would support job creation. Over the 2008-2012 period, Government expenditure grew by 20 per cent, while revenue contracted by 2.8 per cent. The Government deficit rose from 2.3 per cent of GDP in 2008 to 6.9 per cent in 2012.

Table 1. The Bahamas: Selected Macroeconomic Indicators

Table 1											
Selected Macroeconomic Indicators											
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Nominal GDP Growth Rate	6.8%	-0.1%	2.1%	8.6%	3.4%	4.4%	-0.9%	-5.2%	0.9%	-0.2%	3.5%p
Real GDP Growth	2.7%	-1.3%	0.9%	3.4%	2.5%	1.5%	-2.3%	-4.2%	1.0%	1.7%	1.8%p
Unemployment Rate	9.1%	10.8%	10.2%	10.2%	7.6%	7.9%	8.7%	14.2%	N/A*	15.9%	14.7%p
Inflation Rate	1.5%	2.7%	1.4%	2.1%	2.1%	2.5%	4.7%	2.0%	1.3%	3.2%	2.0%
Selected Debt Indicators											
Direct Charge/ GDP	25.9%	27.9%	29.6%	29.0%	30.0%	31.7%	33.5%	42.5%	47.2%	48.3%	53.9%p
National Debt/GDP	32.0%	34.6%	35.8%	35.5%	36.2%	36.9%	39.0%	50.0%	54.3%	55.3%	61.2%p
External Debt/GDP	1.3%	4.2%	4.0%	3.7%	3.6%	3.3%	4.7%	9.0%	9.2%	10.1%	12.7%p
Domestic Debt/GDP	24.6%	23.7%	25.6%	25.3%	26.3%	28.4%	28.9%	33.5%	37.9%	38.2%	41.2%p
Primary Balance/GDP	-0.5%	-1.5%	-1.2%	-0.5%	0.3%	-0.5%	0.3%	-1.0%	-0.4%	-3.1%	-2.4%p
Tax Revenue/GDP	11.5%	11.8%	12.0%	12.8%	14.5%	14.4%	15.5%	13.6%	14.2%	17.8%	15.2%p
Fiscal Deficit/GDP	-1.9%	-3.0%	-2.8%	-2.1%	-1.2%	-2.7%	-2.3%	-5.2%	-4.8%	-4.1%	-6.8%p
Debt Service Ratio	4.9%	12.1%	3.1%	3.0%	2.4%	5.7%	2.8%	20.2%	7.4%	5.4%p	5.1%p
Source: The Central Bank of the Bahamas *Census Year P: Provisional											

Source: The Central Bank of The Bahamas

Figure 7. The Bahamas: Real GDP Growth (2002-2012)

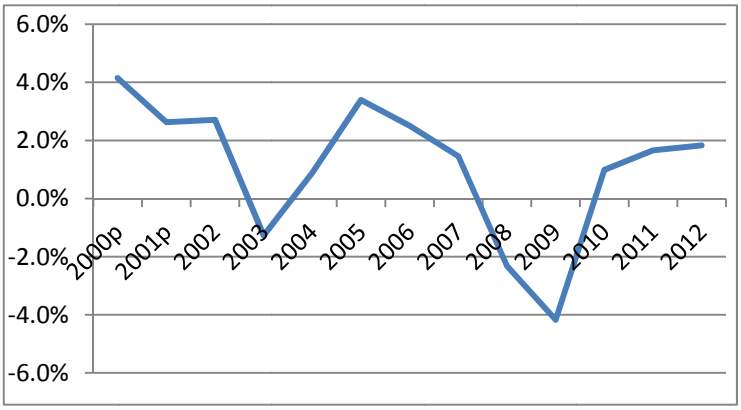
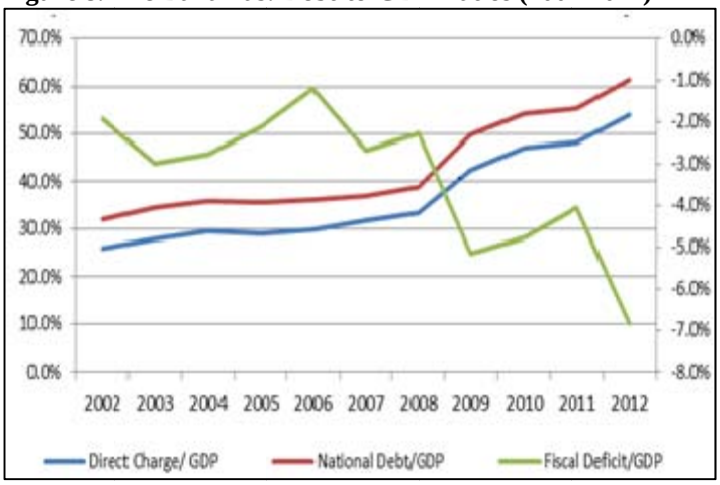


Figure 8. The Bahamas: Debt-to-GDP Ratios (2002-2012)



The Bahamas has historically sourced the majority of funding for the deficit domestically through long-term Government bonds, Treasury bills and loans and advances from the domestic banking system. In recent years, the fraction borrowed externally has increased notably. In 2012, deficit financing amounted to $763.3 million, with 67.2 per cent sourced domestically and 32.8 per cent obtained externally via an external bond issue. This compared to 2008, when total financing was $343.5 million, with only 4.0 per cent from external sources.

The National Debt, not including contingent liabilities, climbed to $4.4 billion in 2012 (23.6 per cent of which was external and 76.4 per cent internal), from $2.8 billion in 2008 (with external of 13.9 per cent, and internal 86.1 per cent). Including Government's contingent liabilities, the debt was $5.0 billion in 2012, representing an increase of 55.3 per cent ($1.8 billion) over 2008. As a percentage of GDP, the debt

(not including contingent liabilities) rose to 53.9 per cent in 2012 from 33.5 per cent five years earlier. (Table 1)

Barbados

Fiscal policy in Barbados since the onset of the 2008 recession has been explicitly targeted to sustain the level of foreign exchange reserves by containing aggregate demand in the economy, and through judicious external borrowing. Aggregate demand management has dampened imports sufficiently, and foreign reserves at end-April 2014 were the equivalent of 16 weeks of imports, about the same level of coverage as in December 2008. The servicing of external government debt in 2013 absorbed 7.6 per cent of foreign exchange earnings. However, overall net public sector debt-to-GDP was relatively high at 67 per cent, the result of a large overhang of project financing from before the Great Recession, and economic stagnation and declining tax revenues since 2008.

The ratio of Government expenditure to GDP was reduced from the mid-30s per cent at the time of the 1981-2 economic adjustment programme undertaken by the Barbados Government, but that ratio rose in 1985 and remained little changed until the 1991-3 crisis, when the ratio was cut by more than five percentage points of GDP. However, from mid-1990s the ratio rose aggressively, to peak at about 35 per cent in the early 2000s. The expenditure ratio was again reduced over the years 2002-7, but after that the ratio spiralled upwards once more.

Figure 9. Barbados: Government Revenue, Expenditure and Deficit

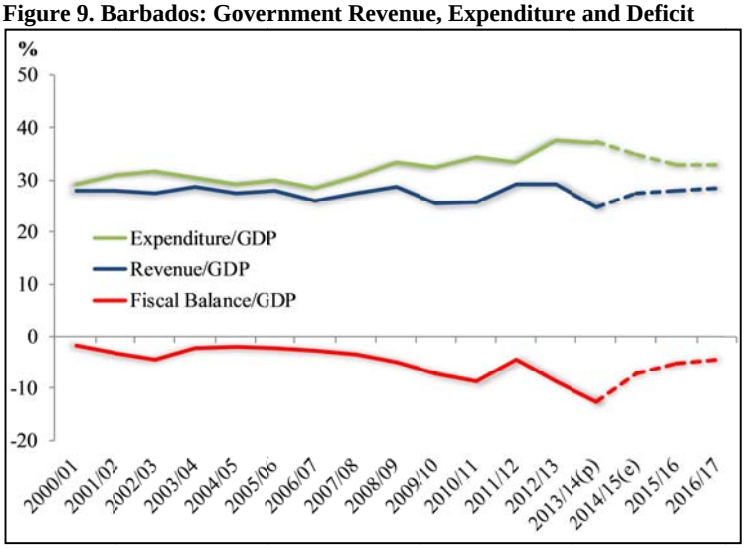
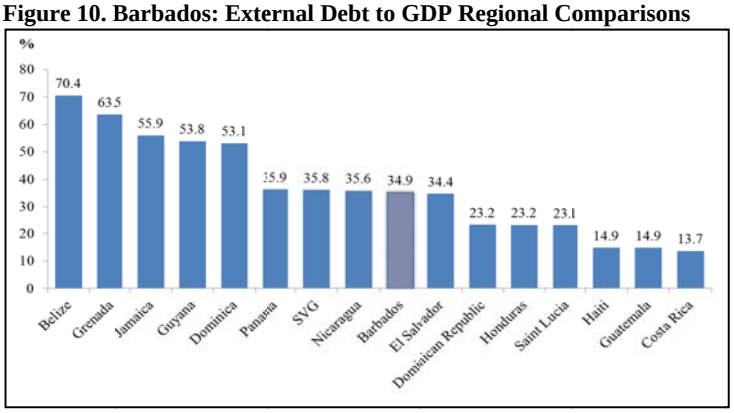


Figure 10. Barbados: External Debt to GDP Regional Comparisons



Revenues have typically been lower than expenditure, resulting in overall fiscal deficits. The revenue-to-GDP gap of about eight percentage points in the early 1980s narrowed over that decade, as the revenue ratio increased over time. With the contraction in expenditure in the early 1990s the budget was in balance by the mid-1990s. However, growth in the revenue ratio thereafter was much slower than for expenditure, and the gap widened to more than five percentage points of GDP. Once more expenditure was depressed, and a balance was achieved, briefly, in 2007. The growth of expenditure since then has taken the deficit to unprecedented levels, as a ratio to GDP.

The economic crisis threat in Barbados in 1991 was triggered through the balance of payments. Government was unable to roll over maturing foreign debt at a time when an excess demand for imports had depleted the Central Bank's foreign currency reserves. The overall debt-to-GDP ratio was not excessive at about 60 per cent, and most domestic debt was rolled over without difficulty, since it remained in domestic currency.

The main driver of government expenditure over the entire period has been government's wages bill. Wage costs rose by two to three percentage points of GDP in the 1980s, and by about five points in the 2000s. Interest payments were also a persistent source of pressure on spending through the three decades. On the other hand, expenditure on goods and services declined in real terms. Capital expenditure declined as a ratio to GDP in the 1980s, with an especially severe contraction during the 1991-3 adjustment period. Capital spending recovered in the late 1990s and the 2000s until 2007, when renewed efforts to close the deficit fell most heavily on the capital account.

Government revenue buoyancy has been high by international comparison, with buoyancy estimated at 2.46 and 2.34 by alternative methods. In a small sample of emerging market countries buoyancies quoted ranged from 0.16 (Brazil) to 2.4 (Mexico). The adjustment programme of 1991-3 was the only occasion when Government had a problem in financing debt. The choice was made to cut aggregate expenditure and restore external balance, so as to regain the capacity to service external debt.

Suriname

The Surinamese economy has become more resilient in the face of external economic shocks, largely because of diversification of the country's export base, from excessive dependence on bauxite, to rely more on exports of petroleum and gold. Dutch development finance played a major role in financing fiscal deficits, until the Dutch Government withdrew its support in 1982. Into the lacuna stepped the Central Bank, providing finance, but with the inevitable consequence of overwhelming demand pressure on the foreign exchange market, import scarcity, and steep devaluation of the currency on the parallel market. The official exchange rate was devalued and market distortions removed in association with a stabilisation programme in 1994. The currency was subsequently devalued in 2000 and 2011. Arrears accumulated during the period of market distortions, but they were resolved with the resumption of Dutch financial assistance in 2000.

Introduction

This analysis reviews economic growth data over the period 1957-2012. There were two episodes of rapid growth (1957 –

1971 and 2001 – 2012) and one of stagnation (1972 – 2000) marked by rapid fluctuations in the economy.

Economic growth

The first growth period lasted 15 years, with average growth of 6.9 per cent per year and steady improvement in the standard of living. Large-scale investment in mining and processing facilities and in infrastructural works in support of the bauxite sector contributed to the take – off in this period; bauxite mining and processing became by far the most important contributor to GDP, export earnings and tax revenue. The contribution of the sector to overall export earnings fluctuated between 70-80 per cent of the value of merchandise exports from the beginning of the Second World War until the end of the 20th century. Substantial fluctuation in the growth rate reflected the volatility in the international bauxite price.

The second growth take-off started in 2001 and has lasted until the present. Average growth in this period was 4.4 per cent and was fueled by robust performances in oil and gold mining activities, which have now expanded to exceed bauxite as the major engines of growth.

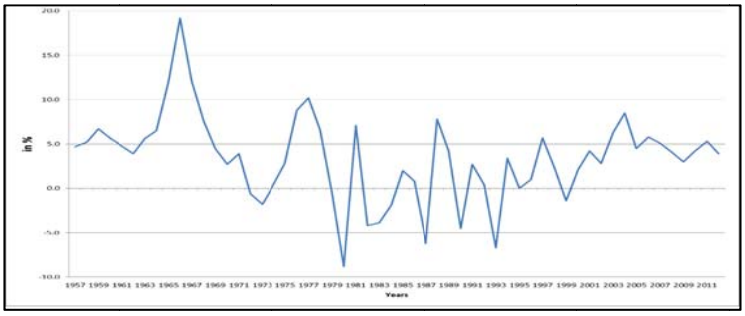
The period of stagnation (stretching 29 years) was characterized by macroeconomic imbalances, wide fluctuations in macro variables and political difficulties which affected the overall performance of the economy. Average growth was a disappointing 0.9 per cent.

Official development assistance

Official development assistance has played a crucial role in the economic development of Suriname in the last 55 years.

Dutch official financial assistance to Suriname was the most important source of government capital expenditure, a source to finance the balance of payments and current account deficits and a cushion in times of decreases in foreign exchange earnings from the bauxite sector.

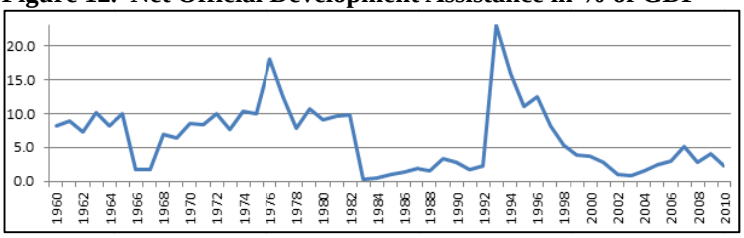
Figure 11.: Economic Growth in Suriname



During the first period of growth take–off, the average development assistance to Suriname was 7.2 per cent of GDP, and this rose to 10.5 per cent during 1972 – 1982 period. The suspension of Dutch aid in 1982 combined with declining earnings from the bauxite sector and accentuated by distortionary macroeconomic policies, resulted in poor economic performance, with negative effect on the standard of living.

Dutch aid during the second growth period was instrumental to the buildup of the depleted foreign exchange reserves, the restructuring of government domestic debt, the servicing of foreign debt and the financing of infrastructural projects. The average inflow during this period was 2.6 per cent of GDP.

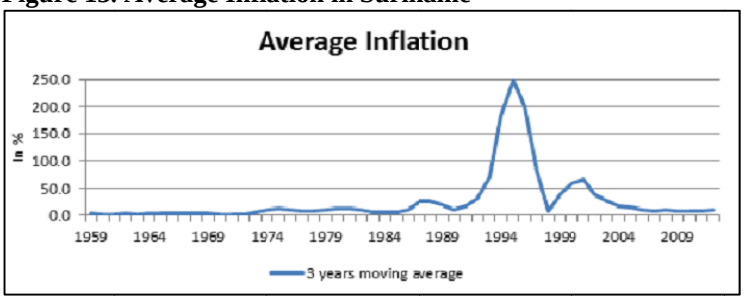
Figure 12. Net Official Development Assistance in % of GDP



Inflation

The first period of growth was accompanied by low inflation averaging 2.3 per cent. During the period towards independence in 1975 and the suspension of the Dutch aid, the average inflation was 9.7 per cent which was partly the result of the international oil crisis in 1973 and domestic demand pressures. Despite the distortionary macroeconomic policies during 1983 – 1993, inflation remained low. The implementation of stabilisation measures in 1994 in which exchange rate unification was a key policy measure, caused a spike in prices. The three-year average inflation peak in in this period was 250 per cent. Inflation during the second growth period was 13.3 per cent, reflecting the impact of stabilisation measures at the beginning of the period, import inflation and domestic demand pressures.

Figure 13. Average Inflation in Suriname

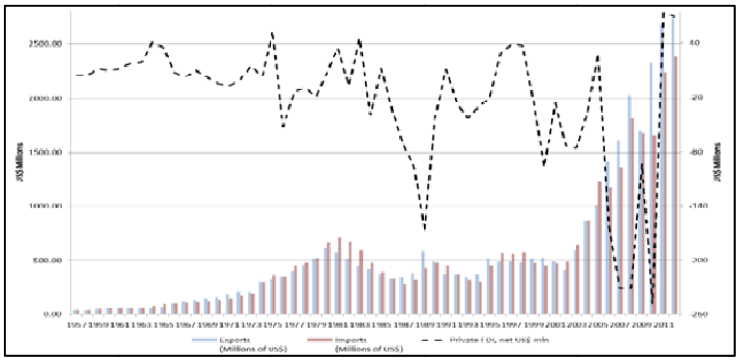


Balance of Payments

The overall balance of payments reflects the swings in the bauxite sector, and the suspension of Dutch financial assistance. A long period of foreign exchange shortage followed, affecting imports and the overall level of economic activity.

The full resumption of aid during the second growth period increased exports from the gold and oil industries, and the effects of stabilisation measures, restored external balance in the second growth period.

Figure 14. Suriname: Imports, Exports & FDI



Exchange rate

Suriname maintained a fixed exchange regime till 1994, but by that time decreased inflows of foreign exchange along with distortionary macroeconomic policies had driven most transactions to the parallel foreign exchange market. In 1994 the existing multiple exchange rates were unified and supporting stabilisation measures brought stability in the foreign exchange market. Wide divergences between the official and free market rates necessitated further official exchange rate adjustment in 2000. In 2011 there was another official exchange rate adjustment, after currency reforms in 2004 which eliminated three zero's and introduced a new local currency.

Government Finances

During the first growth period government revenues outstripped government expenditures. This was followed by expansionary fiscal policies during the period of stagnation when large fiscal deficits were financed mainly through monetisation. Fiscal adjustment was part of an economic

stabilisation package during 1994 – 1996, but this was followed by a new round of expansionary fiscal policies financed once again by money creation.

Figure 15. Suriname: Foreign Exchange Reserves & Import Coverages

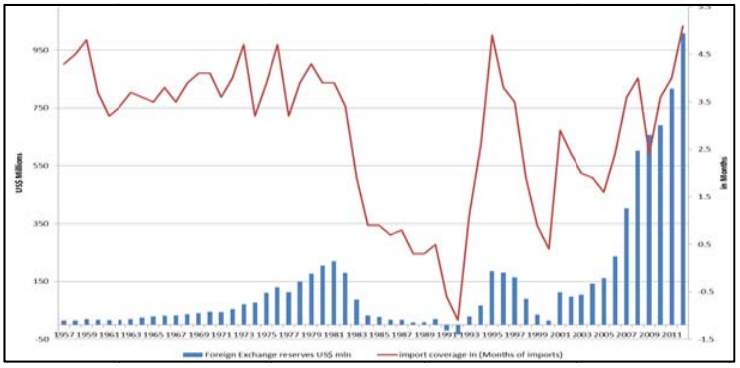
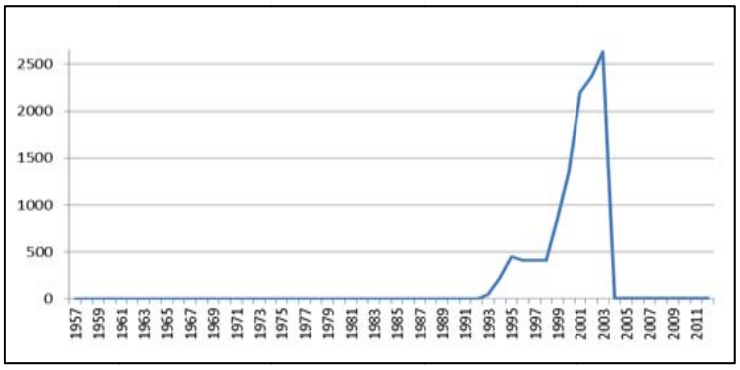


Figure 16. Suriname: Official Exchange Rate



Government revenues benefited from the gold and oil sectors during the second growth period, but additional revenue-

raising measures were necessary to bridge a widening gap between expenditure and revenue. Overall during this period, government finance was characterised by low deficits and surpluses.

Public Debt

Dutch financial assistance made foreign borrowing unnecessary during the period 1957 – 1982, and at the time of independence Suriname enjoyed full debt forgiveness from The Netherlands. During the period of declining foreign exchange earnings from the bauxite sector and the suspension of Dutch aid, Suriname did not have access to foreign credit markets because of its low credit worthiness, and arrears accumulated, causing a spike in the debt-to-GDP ratio in 1988.

The fall in the debt-to-GDP ratio, to below 20 per cent in 1996, was because of high inflation during the structural adjustment period 1992 – 1996. With the full resumption of Dutch aid after 2000, Suriname was able to eliminate these arrears. In 2000 Suriname passed a Debt Act which imposes a ceiling of 60 per cent for the ratio of debt to GDP.

Figure 17. Suriname: Expenditures & Revenues

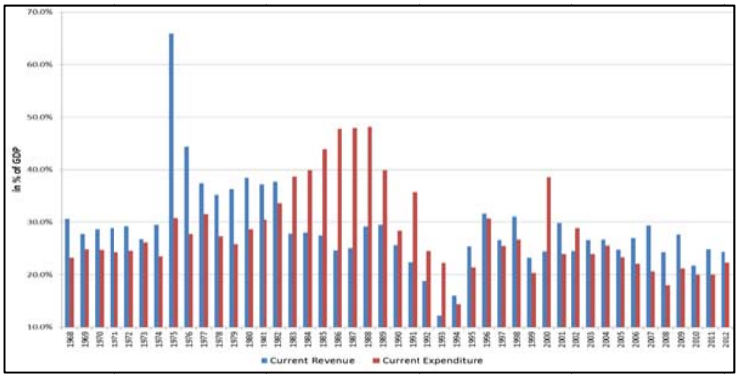
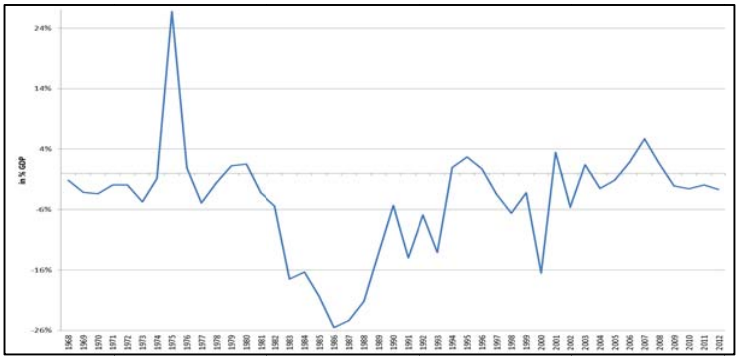


Figure 18. Suriname: Overall Balance



Monetary Developments

Monetary development follows the same pattern as government finance and the balance of payments. During the period of stagnation and the second take–off, monetary policy was very accommodative to fiscal policy through deficit financing by the Central Bank. Interest rate developments followed very closely the pattern of inflation.

Figure 19. Government Debt in Suriname

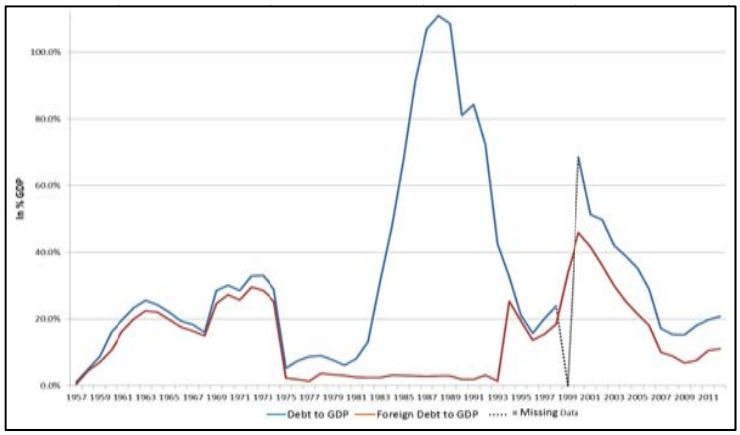


Figure 20. Suriname: CBVS Lending to Government in % of GDP

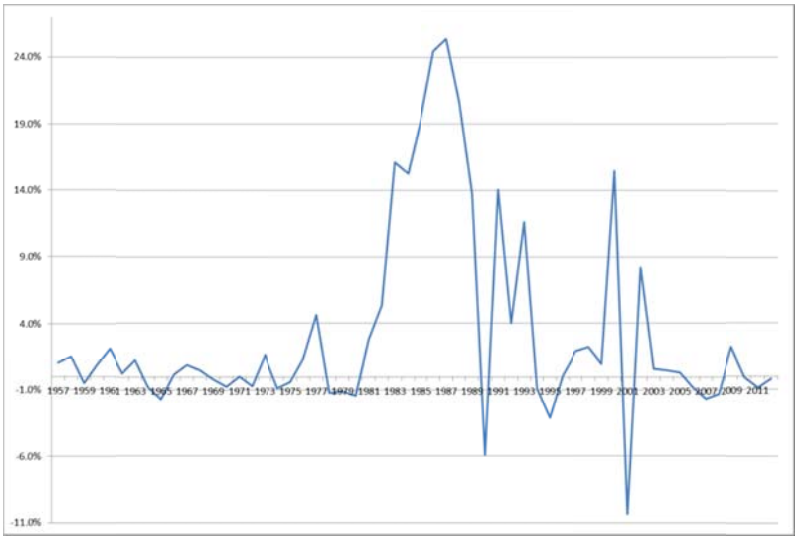
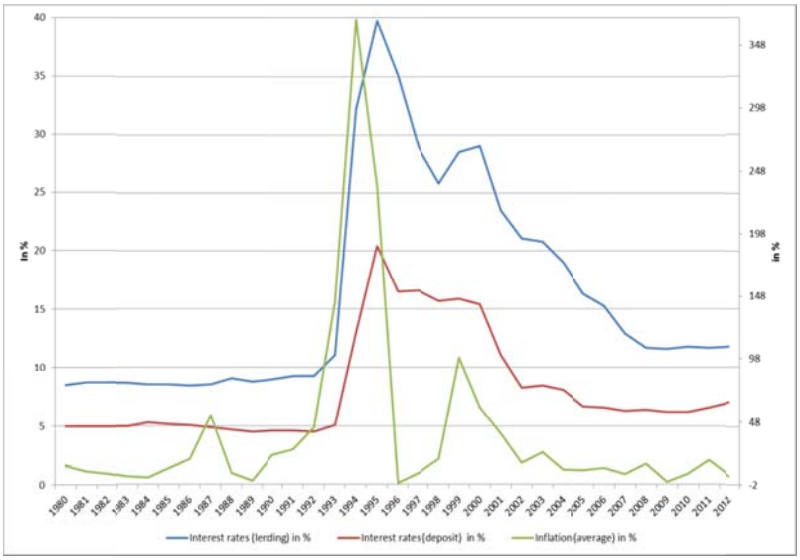


Figure 21. Suriname: Interest & Inflation



Countries with Debt Restructurings and Exchanges

Belize

In 2005 Belize's external debt-to-GDP ratio was 84 per cent. A debt restructuring programme in 2007 was occasioned by perilously low foreign exchange reserves, insufficient to cover an expected bullet payment of US$157 million. By 2011 the ratio of external debt to GDP was 69 per cent of GDP, and annual debt service payments were nine per cent of foreign exchange inflows on the current account. Interest payments absorbed 13.1 per cent of Government revenues, and were set to increase with a step- up in negotiated interest in 2012. The second debt restructuring brought additional relief, with the

ratio of external debt to GDP at 63.8 per cent[7], the ratio of external debt service to foreign exchange earnings at 4.2 per cent, and the ratio of interest payments to Government revenues at 3.2 per cent.

Introduction

Belize has a small open economy with per capita income of US$4,863 and a ratio of exports and imports of goods and services to GDP of 120 per cent. The economy is dependent on tourism, primary commodities and agro-manufactured goods for export and foreign exchange, and since the onset of the global economic recession the annual growth rate has averaged 2.5 per cent. In addition to being susceptible to natural disasters, Belize has inadequate physical infrastructure of roads, bridges and ports, high cost of services provided by public utilities and relatively high rates of unemployment, poverty and crime.

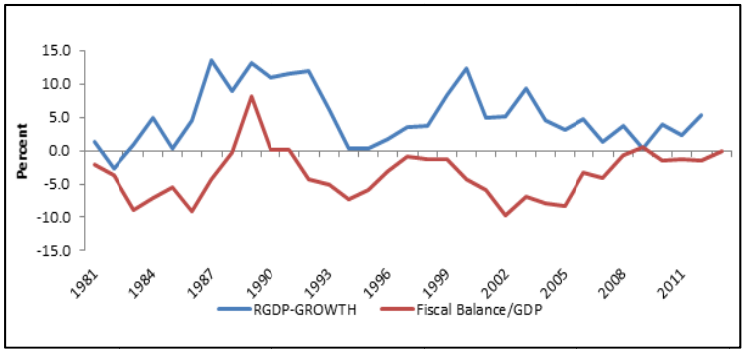
Since 1981, the date of its independence, Belize has experienced cyclical fluctuations in GDP growth, associated with fiscal expansion/contraction, levels of foreign investment, trends in the international economy and the expansion in productive capacity. Average annual growth in GDP was marginal (0.9 per cent) from 1981 to 1985 with export earnings falling significantly due to the collapse in world sugar prices[8]'. At the same time, there was a spike in the fiscal deficit, rising public debt and a sharp increase in the external current account deficit, with a fall in official reserves so large that Government could not fully service its external liabilities. The ensuing accumulation of arrears required

[7] Ratio at end of June 2013

[8] Economic & Legal Advisory Services, Commonwealth Secretariat 1995,3

central government to enter an IMF stand-by arrangement with additional support being received under a USAID stabilization programme. After a two-year adjustment period, increasing FDI flows into tourism, construction and agriculture, combined with an improved external environment, underpinned the ten per cent growth in output between 1986 and 1989. Official grants and receipts from the partial sale of shares in the local telephone company improved central government's position with a surplus of 8.5 per cent of GDP recorded at the end of the period. The external current account balance also improved, due mostly to increased inflows from the growing tourism sector and the official reserves rose from US$0.05 million at the end of 1984 to US$62.9 million or 3.6 months of import cover at the end of 1989.

Figure 22. Belize: Real GDP Growth versus Fiscal Balance (% of GDP)



Although FDI flows subsequently fell, GDP was supported by a significant ramping up of capital expenditure and an expansion in the wage bill that drove up central government expenditure by 19.81 per cent between 1990 and 1993.

Consequently the fiscal position reverted to a deficit of 5.5 per cent of GDP by the end of FY 1992/1993. Government increased its use of the Central Bank overdraft facility as well as external commercial borrowing at higher interest rates and shorter maturity to finance the deficit. The external current account position deteriorated from a surplus of 5.3 per cent of GDP in 1990 to an 8.7 per cent of GDP deficit in 1993 due to an expansion in the trade deficit, exacerbated by increased public interest payments and the leveling off of tourism inflows. Official reserves consequently fell from 4.2 to 2.0 months of import cover.

In order to put the fiscal accounts on a more sustainable trajectory, significant cuts were made in capital expenditure and the government retrenched several hundred public officers in an attempt to curtail the wage bill. Financial support for the balance of payments came from the Republic of China/Taiwan, which provided US$26 million in funding. The fiscal contraction contributed to a sizeable reduction in the overall budget deficit[9] but it had a constraining effect on GDP growth which averaged 1.9 per cent per annum between 1994 and 1998. At the end of 1998, the external public debt-to-GDP ratio was 37.7 per cent while the external debt service ratio stood at 9.8 per cent.

[9] From 7.7% of GDP in FY 1993/1994 to 1.3% of GDP at the end of FY 1997/1998

Figure 23. Belize: Import Cover (months)

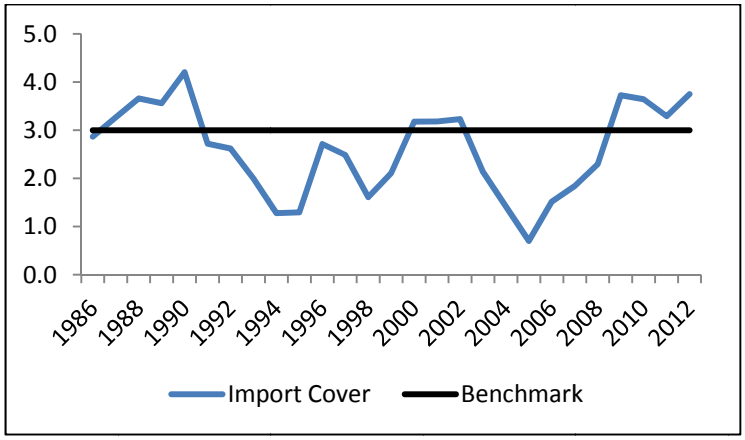
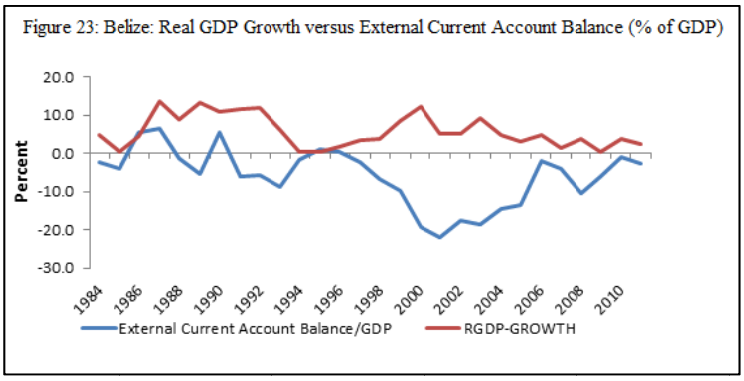


Figure 24. Belize: Real GDP Growth versus External Current Account Balance (% of GDP)



Real GDP growth accelerated to 6.5 per cent between 1999 and 2006, underpinned by expansionary fiscal and monetary policies implemented by the newly elected government.

During the year 2000, there was a 283.1 per cent increase in public external commercial borrowing through the issuance of two international bonds and funds obtained from other commercial sources. The overall fiscal deficit rapidly expanded to an unprecedented 9.7 per cent of GDP in 2001, financed by international borrowing which, along with the increase in import demand, led to an immediate deterioration of the external current account with the deficit averaging 19.6 per cent of GDP in the period from 2000 to 2002. By mid 2001, the Central Bank's foreign reserves were essentially depleted and it was necessary to borrow from abroad to meet international obligations and avoid a collapse of the fixed exchange rate. Since the government did not alter its programme of fiscal expansion, international commercial bond issues became annual necessities at ever rising interest rates as the country's risk profile deteriorated.

Table 2: Belize: Evolution of Total External Public Sector Debt (US$mn)

	1981	1984	1990	1993	1998	2003	2006
Total	**56.5**	**70.6**	**132.9**	**167.9**	**260.8**	**749.8**	**985.2**
Bilateral	14.0	20.2	54.1	66.2	87.7	121.0	212.6
Commercial	1.8	1.8	14.2	17.8	47.4	452.0	560.9
Export Credit	12.6	12.4	2.0	21.8	8.1	4.4	0.1
Multilateral	28.1	36.2	62.6	62.1	117.6	172.4	211.6
Economic Indicators							
Debt to GDP	29.3	33.5	32.2	29.9	37.7	75.9	81.3
Debt service Ratio	n.a.	6.7	7.2	5.3	9.8	15.7	17.0
Inflation (%)	n.a.	n.a.	n.a.	1.5	0.9	2.6	4.2
Real GDP Growth (%)	1.4	4.9	11.5	0.2	8.8	9.2	4.7

Debt Restructuring 2006-2007

By the end of 2005, the ratio of external debt to GDP stood at 83.6 per cent and central government spending on interest payments accounted for a quarter of its current revenue. In the eight-year period (1998-2006) the external public sector debt had almost quadrupled to US$985 million with commercial obligations accounting for approximately 57 per cent of the total. Maturities were tightly bunched over a ten-year period (2005-2015) with sharp spikes occurring when bullet payments for designated international bonds became due. Matters came to a head in 2006, as in addition to already high servicing costs, the authorities were facing an upcoming bullet payment of US$157 million as bond holders had signaled their intention to exercise a put option in 2007. The Central Bank's external asset ratio fell below its legally mandated threshold several times in 2006 and it was necessary for the government to rely on bilateral disbursements to ease its cash flow and enable it to meet its external debt servicing obligations. The government thus had no choice but to initiate the first formal debt restructuring process.

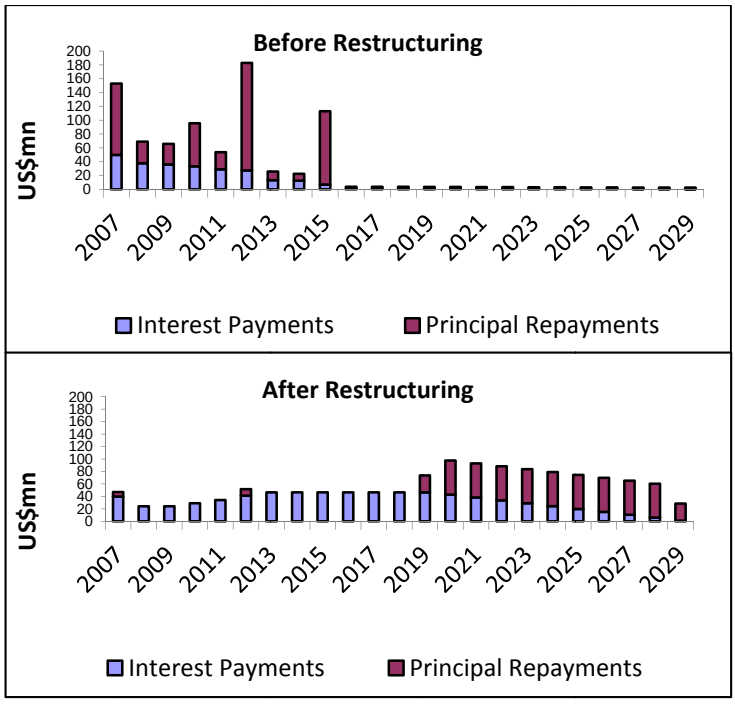
In mid-2006, the government obtained a resolution from the National Assembly to restructure some US$565 million of its commercial external obligation (see table II), while they sought and received financial support from multilateral and bilateral sources. On December 18, the Debt Exchange offer was formally launched and debt service payments were temporarily suspended with the Government offering to pay accrued interest payments up to the closing date of the exchange offer as a "fee" to the participating creditors only. By the end of 2007, 99 per cent of participating claims had been tendered. The terms extended the final maturity of the affected debt out to 2029, incorporating a 12-year grace period on principal repayment, and lowering interest rates,

from 11.0 per cent to 8.5 per cent. However, after restructuring the level of public debt remained high at 87.8 per cent of GDP, with the ratio of external debt to GDP at 75.4 per cent.

Why the Second Restructuring?

There was a variety of challenges after the restructuring as the global economic crisis caused a downturn in international trade, travel and financial markets. Belize was particularly affected through decreasing tourism arrivals and revenues,

Figure 25. Belize: Debt Service Projections



merchandise exports, remittances and foreign direct investments. After growing by an average of 4.7 per cent between 2001 and 2007, the average growth in GDP slowed to 2.1 per cent over the 2008-2011 period.

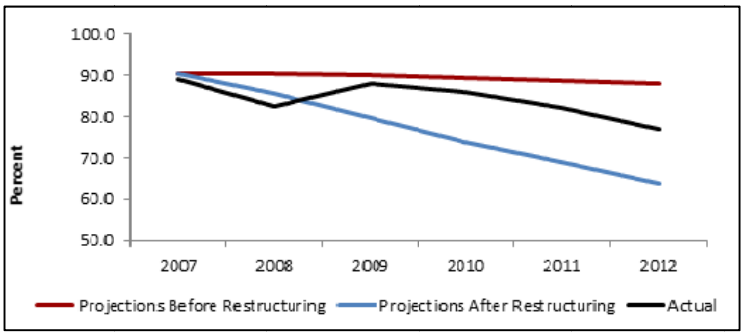
The important issues of concern at the time included the negative impact of the global recession on GDP and government revenues, the downturn in domestic production since its peak in 2010 when it had accounted for 10.9 per cent of tax revenues, the significant reduction in grant receipts and the significant increase in the cost of servicing the restructured bond as the interest rate was slated to rise from 6.0 per cent to 8.5 per cent in August 2012. At the end of 2011, the ratio of the external debt to GDP stood at 68.6 per cent and annual debt service payments of US$81.4 million were only 10.7 per cent lower than they were prior to the 2007 restructuring. Meanwhile, due to the necessity of generating a primary surplus, the government was constrained in its efforts to restore the nation's deteriorating physical infrastructure and cover the cost of improving the fundamental social pillars of health and education. It also faced a shortage of funds to meet the security challenges of rising crime and Guatemalan border encroachments. Moreover, despite imposing a temporary wage freeze, government was unable to meet the respective fiscal targets of 3.5 per cent and 2.5 per cent of GDP for the primary surplus and budget deficit during the five-year period following the restructuring. On average the primary balance with grants was 3.0 per cent, however excluding these flows it averaged approximately 1.4 per cent of GDP. Simultaneously, the fiscal deficit was 1.9 per cent of GDP; however without the grant funding it would have averaged 3.0 per cent.

The case for a second restructuring was based on the fact that, after the first restructuring, debt service payments (at 20 per

cent of Government revenues) were in excess of the Joint World Bank-IMF's Debt Sustainability Framework's 18 per cent threshold for low income countries. Adding to the escalating pressures on the public finances was the need to make provision for the government's contingent liabilities, some of which were under litigation, and the necessity of compensating the previous owners of Belize Telemedia Ltd and Belize Electricity Limited, the telephone and electricity utilities that were respectively nationalized in 2009 and 2011.

Figure 26. Belize: Public Sector Debt-to-GDP ratio (%)

Debt Restructuring 2013



In March 2012, the Prime Minister formally announced the Government's intentions to restructure the 2029 bond and hired experts in the field to provide financial and legal advice to help guide the negotiations. In September, the government made a partial payment of US$11.6 million on obligations of US$23 million, to pave the way for more cordial talks with the bondholders. On this occasion Belize failed to obtain input or support from any international financial agency. An in-principle agreement was announced by the Prime Minister on 21 December, with both sides settling upon a 10 per cent discount, a coupon of 5 per cent for 4.5 years that would

increase to 6.788 per cent for the remaining life and a principal grace period of six years, with the bond to mature in 25 years. Agreement of these financial terms was announced on March 20, 2013, with the participation of 86 per cent of the bondholders. The new debt instrument is projected to provide savings of US$247.0mn on coupon payments over the next ten years with 43.3 per cent reduction in net present value terms when compared to the 2029 'super-bond'. Between 2013 and 2029, the mean annual reduction in debt service payments is 65.1 per cent or US$85 million per year. After restructuring the ratio of external debt to GDP was 62.5 per cent, and the ratio of external debt service to current account earnings on the balance of payments is 5.8 per cent.

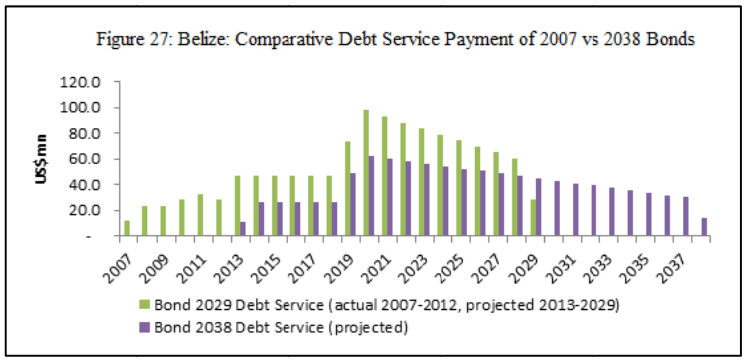
Comparison of 2007 and 2013 Commercial Debt Restructuring

The first restructuring was the result of excessive fiscal expansion financed by short-term commercial loans that then necessitated repeated re-financings at ever higher interest rates. This ultimately resulted in a balance of payments crisis. As the country's foreign reserves deteriorated, it became unable to service the external debt and maintain its fixed exchange rate system without external assistance. The second restructuring was a pre-emptive measure to ensure future fiscal and debt sustainability and maintain stability in the economy. It was instigated by the downturn in economic activity due to the global crisis, declining oil revenues and the sharp increase in debt service due to the step-up coupon payments on the super bond.

Belize is projected to receive US$247 million in cash flow relief over the coming decade. These amounts signify the difference in interest payments to 2023. Because the maturity of the bond has been lengthened, savings need to be

accumulated to prepare for payments to 2038 (see chart VII). In order to achieve this objective, expenditure controls need to be maintained, new revenue measures may be required while budget preparation and monitoring is streamlined. Belize remains vulnerable to external shocks, and in light of this, the Government has made a commitment to improve its debt management capacity. Various measures have been programmed including the formulation of a Medium Term Debt Management Strategy, the establishment of a Debt Management Committee, enactment of a Public Debt Management Act and a new Securities and Capital Market Act, and modernization of the process for securities trading, among other initiatives.

Figure 27. Belize: Comparative Debt Service Payment 2007 vs 2038 Bonds



Jamaica

Jamaica's public sector debt had been recognized as limiting economic growth and the provision of essential social services for many years before the Global Financial Crisis *(GFC). At the onset of the GFC the interest cost of debt service absorbed close to half of all Government revenues.*

The impact of the GFC on world growth worsened this already untenable situation. As a precondition for IMF assistance with their adjustment programme, the Government negotiated a debt exchange in early 2010. However, the adjustment programme which was undertaken following this debt exchange soon went off track. Consequently, Government secured agreement on a second debt exchange – and arranged a new adjustment programme with IMF support – in February 2013.

Introduction and background

Over the past decade, Jamaica's total public debt has exceeded 100 per cent of GDP. The associated high interest costs constrained the Government's ability to spend in key areas such as health, education and social welfare, contributing to low economic growth and slow progress in the Millennium Development Goals (MGDs). With the advent of the GFC, world growth declined from approximately five per cent to below negative five per cent between 2007 and 2009. Jamaica, given its size and relative openness, was significantly impacted by the crisis.

The decline in world demand resulted in major declines in key sectors of the Jamaican economy including mining and tourism, which depend on demand from overseas. Alumina, Jamaica's largest export, declined by more than 60 per cent in 2008, while tourism expenditure declined by 2.5 per cent in 2009, relative to growth 3.4 per cent in 2008. At the same time remittance inflows declined sharply, falling to 13.8 per cent in 2008 from 15.2 per cent of GDP in 2007. In this context, Jamaica's current account deficit widened to 17.1 per cent for FY2007/8 from 9.8 per cent for FY2006/7 and real growth declined to negative 1.8 per cent for FY2008/9 from 0.9 per cent in FY2007/8. Additionally, impacted by the GFC

and worldwide recession, private capital dwindled with a loss of investor confidence and increased risk aversion. Tight liquidity in the international capital markets made it difficult for countries to access capital at competitive interest rates, elevating the risk of sovereign debt default and forcing some countries, including Jamaica, to pursue debt restructuring programmes.

At the time of the GFC, the Government of Jamaica was unable to use fiscal policy to stimulate the economy given the already limited fiscal room. Investor confidence waned resulting in added pressure on the value of the local currency, which depreciated by 18.0 per cent vis-à-vis the US dollar between the last quarter in 2008 and first quarter of 2009. In an effort to slow the depreciation in the Jamaican Dollar, the Central Bank tightened its monetary policy stance, increasing the rate on its 90-day Certificate of Deposit by 500 basis points to 20 per cent on 01 December 2008. The high interest rate environment, the high level of debt, and slowing economic growth, resulted in significant deterioration in the fiscal accounts.

The impact on the fiscal accounts was more significant on the expenditure side, and in particular the interest costs of the Government. The sharp depreciation in the exchange rate contributed to an increase in the value of Jamaica's foreign currency denominated debt to just under 55 per cent of total debt at end-FY2008/9 from 50.6 per cent of total debt at end-FY2007/8. Additionally, there was considerable refinancing risk associated with Jamaica's domestic debt, over 40 per cent of which was contracted at a variable rate of interest and more than 16 per cent was scheduled to mature within one year. The increase in the interest rate on Government debt contributed to a 23.2 per cent increase in interest payments in FY2008/9 to 17.3 per cent of GDP, relative to 12.4 per cent in FY2007/8.

On the revenue side, slower growth in tax revenue reflected lower revenue from consumption and income taxes, relative to GDP, and contributed to an increase in interest payments relative to tax revenue to 51.0 per cent of tax revenues, relative to approximately 46.0 per cent in FY2007/8. Jamaica's fiscal deficit as a proportion of GDP increased to 7.4 per cent at end-FY2009/10 from 4.6 per cent at end FY2007/8, while debt-to-GDP, which had been declining steadily prior to the crisis, rose rapidly to about 130.0 per cent of GDP at end-FY2009/10 from 109.2 per cent at end-FY2007/8.

Debt restructuring and reform agenda

By the last quarter of 2009, it had become increasingly clear that Jamaica needed a comprehensive fiscal policy change that would address the fundamental challenges affecting the economy**.** This is particularly in the context where the GFC highlighted real and financial vulnerabilities to external shocks and exacerbated internal and external imbalances. In this context, Jamaica entered into a Standby Arrangement (SBA) with the International Monetary Fund in 2010. The SBA incorporated structural reforms aimed at correcting issues on the fiscal side, as well as strengthening the financial sector. Given the extremely tight fiscal situation, it was recognized that some action had to be taken to provide the fiscal room to conduct the necessary reforms, reverse an unsustainable level of public debt, and to bring interest payments more in line with the Government's resources.

The Jamaica Debt Exchange (JDX) was launched by the Government of Jamaica (GOJ) on 14 January 2010 as a pre-condition to a 27-month SBA. It involved the exchange of public sector securities issued in the domestic market and was designed to reduce the amount of maturing debt over the next

three years by 65.0 per cent as well as generate interest savings of 3.5 per cent of GDP. In order to ensure a stable financial system, the multilateral agencies funded what was known as the Financial Sector Support Fund (FSSF), as a 'worst case' liquidity support facility for financial institutions participating in the debt exchange. At the time of the swap, domestic debt accounted for over 75.0 per cent of interest expense with 40.0 per cent (27.0 per cent of GDP) maturing within two years. The objectives of the swap were to achieve significant extension in the debt maturity profile while lowering the interest costs. In order to maintain Jamaica's constitutionally mandated obligation to honour its debt obligations, the transaction was structured as a par-for-par voluntary exchange.

The transaction, which closed with a near-perfect participation rate of 99.2 per cent on 24 February 2010, significantly altered Jamaica's debt profile. The fixed rate proportion of domestic debt increased by 18.8 percentage points, while the variable rate proportion declined by 15.5 percentage points. There was also a decline of 6.4 percentage points in foreign currency-denominated domestic debt. In order to manage re-pricing risk, investors were only allowed to exchange old bonds for longer dated new bonds[10], and could not exchange fixed rate bonds for variable rate bonds. Interest rates offered on the new bonds averaged 12.5 per cent, well below the average of 19.0 per cent before the exchange.

A key improvement was the concentration of the domestic debt portfolio into a smaller number of benchmark bonds[11].

[10] The weighted average age of domestic bonds increased to 8.3 years from 4.7 years prior to the exchange.

[11] There were 23 new benchmark bonds in the BOJ's electronic central securities depository: nine fixed rate bonds; nine variable

Prior to the exchange, the market was illiquid and fragmented with over 350 bonds. The smaller set of bonds would be traded with much higher liquidity and thus improved the liquidity risk for participants in the exchange. Furthermore, the introduction of benchmark securities also enabled the derivation of a reliable domestic yield curve. In order to facilitate a smooth establishment of the new yield curve, the Bank of Jamaica, in addition to reducing its 30-day signal rate, removed its open market operations (OMO) instruments with tenors over 30 days. Consequent on the fiscal compression, interest rates on the GOJ Treasury Bills (TBills) also declined. The reduction in BOJ's signal rate occurred against the background of the Staff Level Agreement with the IMF and the projected improvement in the fiscal and debt dynamics post-JDX. Given these developments, the level of confidence in the economy was restored to some extent and this was reflected in the value of the Jamaican Dollar appreciating by approximately 4.4 per cent for 2010 in contrast to the depreciation of 10.0 per cent for 2009.

Notably, when the JDX was launched, rating agencies Fitch and Standard & Poor's downgraded Jamaica's sovereign long-term foreign and local currency bonds to 'Restricted Default' (RD) and 'Selected Default' (SD), respectively, labelling it a 'distressed exchange'. However, the agencies subsequently reversed their action, following the approval of the SBA and the successful completion of the exchange (see Figure 1). The rating upgrades were predicated on the 99.2 per cent participation rate for the debt exchange, a reduction in credit risks, significant improvement in the Government's liquidity position, and the substantial multilateral inflow that accompanied the economic programme.

rate; three United States Dollar (USD) bonds; and two CPI-linked bonds.

Notwithstanding the successful completion of the JDX, the economy was faced with critical challenges**.** Sluggish world growth continued to affect Jamaica's earnings, leading to continued low growth and rising unemployment. Monetary policy was limited to some extent in a context where interest rates were relatively low, and Jamaica was still grappling with changing its debt trajectory and accessing credit from external markets. With public debt-to-GDP close to 150.0 per cent of GDP, delays in structural reforms, deteriorating fiscal performances and the temporary room provided by the JDX diminishing, the SBA stalled in January 2011. These factors led Jamaica to re-engage the IMF in 2013, for a four-year Extended Fund Facility (EFF), which triggered a subsequent downgrade by Fitch Ratings. In particular, the downgrade was premised on protracted delay in concluding the IMF agreement and the risk that the programme could be derailed given the deteriorating fiscal and monetary performances.

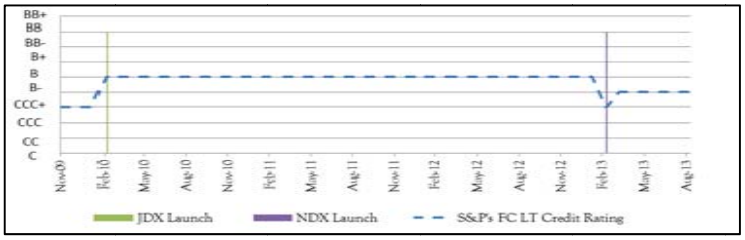
A second debt exchange, the National Debt Exchange (NDX**)**, was launched on 12 February 2013 and was, like the JDX, a pre-condition to an agreement with the IMF. The NDX was designed explicitly to achieve fiscal savings of 8.5 per cent of GDP or J$17.0 billion annually, and contribute to a lowering of the debt ratio to 95.0 per cent of GDP by 2020. In addition, similar to the JDX, the NDX was meant to improve the maturity profile of debt and achieve cost savings of 1.25 per cent of GDP annually on interest expense. The allocation rules were also broadly similar to those under the JDX, and involved the voluntary exchange of GOJ securities for new instruments with lower coupons and extended maturities.

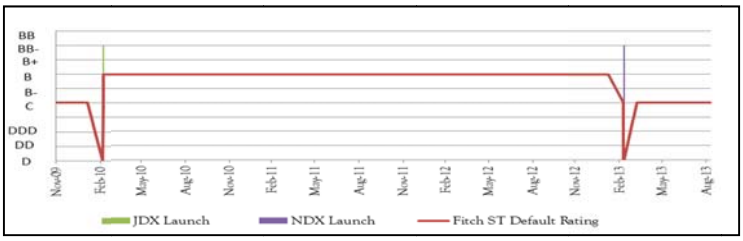
With a participation rate of virtually 100.0 per cent, the NDX was completed in two phases. The first phase included only domestically issued and held bonds, while the second phase was a 'private exchange,' whereby the GOJ exchanged mainly

foreign law bonds with large financial institutions. The average rates on bonds were reduced to 8.4 per cent for local currency bonds, from 12.5 per cent under the JDX, and to 5.0 per cent for USD bonds, relative to 7.0 per cent under the previous exchange. After the NDX, the weighted average age of the domestic debt increased by five years to 12 years, and the variable rate proportion of domestic debt declined by over 11 percentage points. Subsequent to the NDX, the BOJ reduced its signal rate by 50 basis points in February 2013, in a context of projected near-term weakening in domestic demand as well as the onset of strong fiscal consolidation. These developments influenced a fall in yields on the GOJ TBills of over 100 bps. It is important to note that while Jamaica's sovereign ratings were upgraded to 'CCC' following the success of NDX, this rating was still below the pre-NDX ratings[12] .

[12] For an extensive review of the JDX and NDX see Langrin (2013) Policy Lessons from Postmortems of Jamaica's two Recent Debt Exchanges. (Bank of Jamaica: Jamaica).

Figure 28. Evolution of Jamaica's Sovereign Credit Ratings





Comments and conclusion

Jamaica's problems with debt did not materialize overnight but evolved overtime, consequent on both external and internal factors, including natural disasters, banking system failure and the 2008-2009 global crisis**.** The country's challenges with consistently high debt highlights the need for sound macroeconomic policy supported by binding fiscal rules, with adequate flexibility, to ensure that policy is sustainable while allowing the Government to react in times of crisis.

The recent debt exchange exercises undertaken by Jamaica were successful for a number of reasons**.** They represented a broad consensus among all stakeholders for immediate and fundamental change, as well as burden sharing of the

adjustment process towards fiscal and debt sustainability. The design of the exchanges promoted transparency and participation, as they were simple, clear, and equitable in nature. Additionally, policymakers sought to properly identify risks and employed risk mitigation strategies, and, importantly, supported the transaction with a broader programme of reforms. In the case of the JDX, the reforms included the introduction of a Fiscal Responsibility Framework, the establishment of a Central Treasury Management System as well as the implementation of a revamped tax administration programme and public sector transformation. For the NDX, the reforms focused on continuing outstanding reforms agreed under the JDX as well as further strengthening public financial management and introducing a fiscal rule. Both debt exchanges, supported by strong fiscal consolidation, were recognized as necessary to reduce the debt overhang by reversing the fiscal dynamics that hindered Jamaica for two decades.

Following both the JDX and the NDX there were marked declines in Jamaica's interest costs and a significant but temporary lowering of refinancing risk**.** It is clear from Jamaica's experience that debt restructuring is a necessary but not sufficient condition of long-term fiscal, debt and economic sustainability. Importantly, restructuring exercises must be accompanied by an economic programme that ensures that the benefits of restructuring are long-lasting. In the case of Jamaica this must include follow-through on public financial management reforms to improve the collection and use of public funds and debt management reforms to ensure that debt is managed prudently. Importantly, policy must be geared towards maintaining macroeconomic and financial stability, improving competitiveness and ensuring an environment for growth, increased employment and a reduction in poverty.

The ECCU
(Dollars throughout are Eastern Caribbean dollars unless otherwise stated.)

There was a general improvement in fiscal performance across the ECCU countries during the 2002-2008 period. Three countries (Antigua and Barbuda, Dominica and St Vincent and the Grenadines) implemented revenue and/or expenditure reform programmes. The Government debt-to-GDP ratio for the ECCU fell from 84 per cent in 2002, to 74 per cent in 2008. Four ECCU countries attempted to reduce high debt burdens through debt restructuring and/or debt forgiveness prior to the onset of the Great Recession *in 2008. The currency union's consolidated real GDP growth slumped to negative 4.2 per cent when the recession hit in 2009, from 5.1 per cent in 2008, and average fiscal deficits of the countries widened to 5.2 per cent of GDP. On average, the fiscal performance showed improvement over the period 2010-2012, although two countries, St Kitts and Nevis and* Grenada*, sought to restructure Government debt during this period.*

The ECCU countries have small open economies that are externally dependent mainly on tourism and investments, which makes them vulnerable to the vagaries of global economic conditions. On financial sector soundness, the ECCU has experienced a sustained period of financial stability. The quasi-currency board arrangement, which has been in place since 1983, has provided a critical anchor for the Union's financial stability. The Eastern Caribbean Central Bank (ECCB) has pursued a coordinated strategy to ensure continued resilience of the system. The strategy has included the enactment of anti-money laundering legislation, the establishment of financial intelligence units and the issuance

of anti-money laundering guidelines to ensure that the region is in compliance with international standards.

ECCU countries are heavily dependent on trade. At the aggregate level, the trade openness ratio (ratio of exports and imports to GDP) averaged 100.6 per cent during the sample period, ranging from a high of 114.2 per cent on average in Antigua and Barbuda to an average of 79.0 per cent in Grenada. The average growth of imports over the period was 4.5 per cent, compared with the average of 3.0 per cent for exports.

Debt accumulation within the currency union has largely been associated with high exposure to economic shocks, external shocks, natural disasters, fiscal imbalances and depressed economic growth. The ECCU experience may be divided into the following three periods: the 2002-2008 pre-crisis period; the 2009 crisis; and the 2010-2012 post-crisis period.

Pre-Crisis: 2002-2008

The ECCU's average real Gross Domestic Product (GDP) growth reached a high of 10.7 per cent in 2007. Economic growth in the earlier part of the pre-crisis period was influenced by value added in the construction, hotel and restaurant and agricultural sectors.

There was a general improvement in fiscal performance across the countries during the pre-crisis period**.** The overall deficit narrowed from 7.4 per cent of GDP in 2002 to 2.5 per cent of GDP in 2008, resulting in sustained small primary surpluses that averaged 0.3 per cent of GDP. Fiscal performance varied across countries with the improvement particularly marked in Antigua and Barbuda - especially during the period 2005-2007, in Dominica, and to a lesser

extent, in St. Vincent and the Grenadines. The fiscal improvement was underpinned by construction and tourism activity associated with the buildup to Cricket World Cup in 2007 and the implementation of several revenue and expenditure reforms.

Three ECCU countries (Antigua and Barbuda, Dominica and St Vincent and the Grenadines) implemented revenue and/or and expenditure reform programmes**.** Antigua and Barbuda implemented its own home-grown adjustment programme (The National Economic and Social Transformation [NEST] Plan, 2005). As part of the NEST Plan, income tax was reintroduced in 2005, a sales tax was introduced in 2006 and the market-based property tax system was implemented in 2007. Dominica reforms included, among others, the introduction of the Value-added Tax (VAT) in 2006. St. Vincent and the Grenadines introduced the VAT in 2007.

The ECCU region's total outstanding public sector debt, defined as debt incurred by central governments and public corporations, trended upwards to $13.2 billion at the end of 2012 from $8.1 billion at end of 2002, an expansion of 60.1 per cent. A 17.5 per cent growth in the stock of domestic debt accounted for most of the increase. All dependent ECCU countries' debt-to-GDP ratios exceeded 70 per cent. The highest ratios were for Antigua and Barbuda (135 per cent in 2004), St. Kitts and Nevis (153 per cent in 2005; and Grenada (110.0 per cent in 2012). The ECCU has remained more reliant on foreign sources of financing than domestic, but the proportion of external borrowings to total public sector debt has narrowed to 50.5 per cent in 2012 from 59.1 per cent in 2002. New issues of treasury bills and bonds on the Regional Governments Securities Market (RGSM) were an important factor in the growth of domestic debt. Domestic interest payments have consumed a significant portion of debt service

payments. Total debt service payments (i.e. principal and interest) of the ECCU increased to $1,052 million in 2012 from $447 million in 2002.

Four ECCU countries have attempted to tackle high debt burdens through debt restructuring and/or debt forgiveness. In 2004 the Government of Dominica restructured both its domestic and external loans through debt exchanges, swapping bonds and credits for longer-term bonds at lower interest rates. In 2005 Grenada undertook comprehensive debt rescheduling of its official bilateral external debt under the Paris Club. The subsequent 2012 default resulted from failure to meet payment of instruments from the 2005 restructured instruments which left the principal amounts of the debts untouched. In 2006 Antigua and Barbuda entered into negotiation under the auspices of an IMF agreement to restructure approximately 80 per cent of its public debt. In 2007 an agreement was reached with Italy to write-off St. Vincent and the Grenadines' Ottley Hall debt obligation. The loan had been serviced by the Italian export agency, due to perceived malfeasance by the private builder-operator.

The ECCU countries have been affected by a series of adverse shocks such as the decline in preferential access to Europe, declining foreign aid, recessions in developed countries, oil price rises and high global interest rates, the 2009 global economic and financial crisis, and the increased frequency and intensity of hurricanes and tropical storms. The decline in preferential access mainly affected the banana and sugar exporting countries - Dominica, St. Lucia, St. Vincent and the Grenadines and St. Kitts and Nevis, where these crops have been the main foreign exchange earner. On July 30th 2005, St. Kitts and Nevis' sugar factory was closed. At that point total debt owed by the St. Kitts Sugar Manufacturing Corporation (SSMC) to the St. Kitts-Nevis-Anguilla National Bank

Limited and the Caribbean Development Bank was US$129 million. The ECCU countries have been devastated by a series of tropical storms and hurricanes inclusive of Lilly (2002), Ivan (2004), Emily (2005), Dean (2007) and Tomas (2010). A large proportion of Grenada's public sector debt has been attributed to the destruction caused by Hurricane Ivan in 2004, while a large proportion of St. Kitts and Nevis' debt is attributed to the destruction caused by several natural disasters. These shocks caused countries to record slower economic growth and increased public sector spending, particularly through subsidies to spur economic growth.

The Crisis Year: 2009

The currency union's consolidated real GDP growth slumped to negative 4.2 per cent in 2009 from 5.1 per cent in 2008. The crisis period was marked by negative economic growth in all ECCU countries with the exception of St. Lucia, which grew marginally by 0.36 per cent. The average fiscal deficits of the countries widened to 5.2 per cent of GDP. The acute fiscal challenge prompted concerns about medium-term fiscal and debt sustainability and heightened fiscal distress risks and as such, necessitated fiscal adjustment.

Post-Crisis: 2010-2012

On average, the fiscal performance showed improvement over the period 2010-2012. There is little variation in interest rates across the countries in the ECCU given the monetary arrangement. The weighted average lending rates of the ECCU as a whole were on a steady downtrend in the past decade, with an average annual decline of 0.2 percentage point over the period. At end-December 2012, the weighted average lending rate in the ECCU was 9.4 per cent compared with 11.5 per cent at the start of the decade. The weighted

average deposit rates exhibited a similar trend over the period, declining from 4.1 per cent in 2002 to 3.2 per cent in 2012, at an annual average reduction of 0.09 percentage points. Accordingly, the weighted average interest rate spread has narrowed from 7.4 percentage points in 2002 to 6.2 percentage points in 2012.

Measured as ratios of total monetary liabilities of the banking system (M2) as well as total demand liabilities of the Monetary Authority (Backing ratio), reserves have exceeded the prudential limits of 25 per cent and 80 per cent respectively, averaging 47.2 per cent and 97.6 per cent corresponding over the sample period. Expectations of currency stability therefore remain well anchored.

On the ECCU's external competitiveness, the real effective exchange rate (REER) depreciated at an annual average rate of 0.6 per cent over the sample period, with the index falling to 93.5 at end-2012 from 99.9 at end-2002. The external current account deficit was estimated at 16.3 per cent of GDP at end-2012, virtually the same level as at the start of the decade.

The St Kitts and Nevis authorities announced their intention to restructure US$150 million of debt totalling US$1 billion in March 2012. The elements of the debt reduction strategy were:

1. Bonds were exchanged on terms that amounted to a 65 per cent haircut in the net present value of the bonds;

2. Domestic banks acquired Government property that had been pledged as security for their loans to Government, an amount equivalent to 31 per cent of total debt; and

3. External debt was restructured through the Paris Club, and on a bilateral basis.

Treasury bills, debt to the Caribbean Development Bank, and obligations to other international financial institutions were not affected by the restructuring. The reason for restructuring was to reduce the ratio of debt to GDP, which fell from 114 per cent in 2010 to 62 per cent 2013, mainly because of the land swap for the banks.

A newly-elected Grenada administration announced in March 2013 that it intended to restructure all Government and Government-guaranteed debt, except for Treasury bills and borrowings from international financial institutions. Discussions with creditors began in earnest in March 2014. The motivation for the restructuring was to reduce the magnitude of the fiscal effort that would be needed to reduce the ratio of debt to GDP (See IMF, "Ex post assessment of longer term program engagement," January 2014, page 34).

Chapter 4

A Test of Fiscal Sustainability in the Caribbean

In this chapter we build a model that accords with the definition of sustainability as set out in Chapter 1, and test the model on Caribbean countries. Fiscal strategy becomes unsustainable when government has run out of options, and can no longer meet its debt service commitments; in small, very open economies that invariably occurs when foreign exchange reserves are exhausted. In fact, the trigger point comes much earlier, if market agents come to believe that there is real danger that this point will be reached, and take pre-emptive action, leading to capital outflows. In order to explore the limits to fiscal sustainability, therefore, we measure the impact of the fiscal deficit and how it is financed on aggregate spending and the balance of external payments. Should the fiscal stimulus to expenditure become large enough to threaten to exhaust the stock of foreign reserves, there is capital flight, and, as a result, insufficient foreign exchange to service the foreign debt.

Using this framework, we can examine the sustainability of fiscal policy by analyzing the composition of government's deficit financing. The reason for this is that government deficit financing via the existing domestic money supply does not impact reserves in the same way as financing via money creation. If government sources funds from domestic investors using the existing domestic supply of loanable funds, this does not create additional demands on reserves as these funds

might otherwise have been invested in other private sector activity. Conversely, financing via the monetary authority increases the supply of domestic money which allows government to finance its deficit with no corresponding crowding out of private sector activity, but leads to a loss of foreign reserves to the extent that additional finance is ultimately spent on imports, goods and services.

We therefore develop a model that allows us to examine the sustainability of fiscal policy from the perspective of the impact of money creation on reserves. If government is able to finance its deficit solely by the existing domestic money and external borrowing, the reserve position is not compromised, whether that policy is optimal or not. However, if the deficit becomes so large that the monetary authority, as lender of last resort, must expand the domestic money supply to fuel government's unfinanced expenditure, the impact on the reserves can create or exacerbate external current account imbalances to the extent that there is insufficient foreign exchange remaining to fully service the government external debt.

This Chapter is divided into two parts: the first describes the methodology, its components and how it can be applied to the examination of fiscal sustainability in small, open economies. In the second part we analyse Caribbean economies using this methodology, asking the following questions: have there been periods in the recent past when fiscal expansion has put unsustainable pressure on the foreign reserves? Has any country come close to having unsustainable fiscal policy? And how far distant are Caribbean countries from the possibility of a default currently?

Model Summary

The theoretical construct of the model builds on the monetary approach to the balance of payments (MABP) which articulates the relationships between the domestic money supply – and by extension, money creation – and the level of available foreign exchange reserves. Generally speaking, the MABP implies that under a fixed exchange rate regime, full employment and less than full sterilisation of reserves, there is close to a unitary relationship between money creation and reserves such that new domestic money, *ceterus paribus*, results in a corresponding fall in the level of reserves. The mechanism for this, as articulated by Howard and Mamingi (2002) in their study on Barbados, relates to the demand and supply of money. While a surplus on the external balance of payments occurs when the demand for money exceeds the supply, a deficit is indicative of an excess supply of money, which flows out of the country on imports or foreign investment. In the absence of any additional inflows, the result is a fall in the level of reserves of the monetary authority.

The MABP framework begins from a position of equilibrium between the supply of and demand for money; that is:

$$M_s = M_d \tag{1}$$

Where

$$M_s = m(R + D) \tag{2}$$

$$M_d = P.L(Y, i) \tag{3}$$

And m is the money multiplier, R is international reserves, D is domestic credit, P is the price level, Y is real income and i is the market rate of interest. Taking logs and differentiating with respect to time, yields:

$$d\log m + \frac{R}{R+D} d\log R + \frac{D}{R+D} = d\log P + a_y\, d\log Y + a_i d\log i \quad (4)$$

Rearranging the above and replacing the differential by the first difference operator (Δ) provides a testable reserve flow equation of the form:

$$\frac{R}{R+D}\Delta\log R = a_1\Delta\log P + a_2\Delta\log Y + a_3\Delta\log i + a_4\Delta\log m + a_5\frac{D}{R+D}\Delta\log D \quad (5)$$

This testable equation provides a basis to examine the dynamics of the MABP. In particular, the MABP is concerned principally with the a_5 coefficient, which measures the relative impact of increasing the domestic component of the money supply on the level of foreign reserves. Under the MABP, the *a priori* value of this variable, referred to as the offset coefficient, is close to -1. A number of studies have been conducted on this relationship in the Caribbean region (Howard & Mamingi, 2002, Coppin, 1994 and Leon and Molana, 1988), all of which found some support for the MABP and an offset coefficient for Barbados, Trinidad and Tobago and Jamaica of close to -1.

This underlying relationship forms the basis for the formulation of our model, which relies on the notion that additional domestic money creation disrupts the equilibrium position between the supply of and demand for money. That additional money increases aggregate spending power and a sizeable proportion is expended on imports, decreasing reserves.

In the spirit of this model, we deploy a tractable indicator of the macro-level impact of central bank credit to government. We begin with a definition of domestic aggregate spending power *(A)* of the form:

$$A = Y + \lambda W \tag{6}$$

where *Y* is national income, and *W* is a measure of financial wealth.

$$W = \partial FXR + \partial CBCG + \partial CBCB \tag{7}$$

where *FXR* are foreign reserves, *CBCG* is central bank credit to government and *CBCB* is central bank credit to commercial banks.

$$I = f(A) \tag{8}$$

where *I* refers to retained imports. Given the relationship between reserves and imports in which, *ceterus paribus*, the current value of imports is equivalent to the change in reserves from the previous period, we obtain

$$FXR_{t-1} - FXR_t = f(A) \tag{9}$$

which implies that changes in reserves, through the impact of changes in imports, are a function of our aggregate spending power variable defined in Equation 6. In the context of limited central bank lending to commercial banks, we can focus on the influence of CBCG on the reserve position. We can therefore abstract from (1) and (2) an empirical model of the form:

$$FXR_{t-1} - FXR_t = \alpha\left(\frac{CBCG}{A}\right)\beta \quad (10)$$

$$with\ \beta = \frac{\frac{\Delta I}{I}}{\frac{\Delta A}{A}} \quad (11)$$

Foreign exchange reserves

We can apply this approach to examine the sustainability of fiscal policy in the Caribbean. We begin by examining the reserve positions and money creation dynamics of a sample of Caribbean territories over the last 25 years. The charts confirm that given the high import dependence of all of the Caribbean countries in the sample, the level of reserves required to sustain the 12-week benchmark of cover has averaged around 10 per cent. From the charts presented in Figure 29, it is also clear that most of the countries have recorded overall growth in their reserves since 2000, despite intermittent periods of decline. Expressed as a proportion of total GDP, the ECCU has by far the highest levels at over 30 per cent of GDP during the last decade. Perhaps not surprisingly, the levels in The Bahamas, an officially semi-dollarized economy, are the lowest among the sample group. Jamaica's reserve levels, relative to the size of its economy, have been halved since 2006. It is useful to note that in all the countries but Jamaica, international reserves were above the 12-week international threshold at the end of 2012.

The largest foreign exchange increases, measured as a ratio to GDP, were recorded in Aruba, Belize, Jamaica and Barbados. In Belize, foreign reserves increased steadily since 2006, as a result of reduced external interest payments due to the debt restructuring in 2007 as well as improved contribution of the

petroleum sector to foreign exchange inflows. By 2008, reserves had exceeded the threshold. In Barbados, reserves increased from the equivalent of 10 per cent of GDP in 2000 to over 20 per cent in 2004, occasioned by growing tourism receipts, sizeable private inflows related to property investment and external public borrowing. A slowdown in these flows resulted in a decline in this ratio to around 15 per cent by 2012, though reserves remained well above the benchmark. An even more substantial increase occurred in Aruba, as the level of reserves expanded significantly after 2006, moving from around 15 per cent to almost 30 per cent of GDP. As a result, Aruba maintained reserve levels well above the 12-week threshold through 2012[13]. In Jamaica, large increases in reserves reflected a number of external bond issues during the mid-2000s.

In Belize, the levels of reserves remained consistently below the benchmark import requirement up until the early 2000s, at which point there was a consistent build-up which resulted in periods in which reserve holdings exceeded the three-month threshold. In Belize in particular, reserves have been at or above the threshold since 2009. The Aruban case is similar, though the volatility of its imports over the last half-decade – where imports have fluctuated from the equivalent of below 100 per cent of GDP to over 200 per cent - has adversely impacted the observed reserve adequacy. Nevertheless, it is clear that the level of reserve adequacy has increased in these

[13] Calculations of reserve cover in Aruba excluded oil-related imports. The reason is that the oil refinery was self-sufficient at the time it was operational, meaning that the oil refinery generated its own foreign reserves (through its exports) to finance its imports. As a result of this calculation, the import coverage ratio of Aruba was consistently above the 12-week import coverage ratio.

economies, both of which maintain fixed exchange rate policies.

Sustainability in the recent past

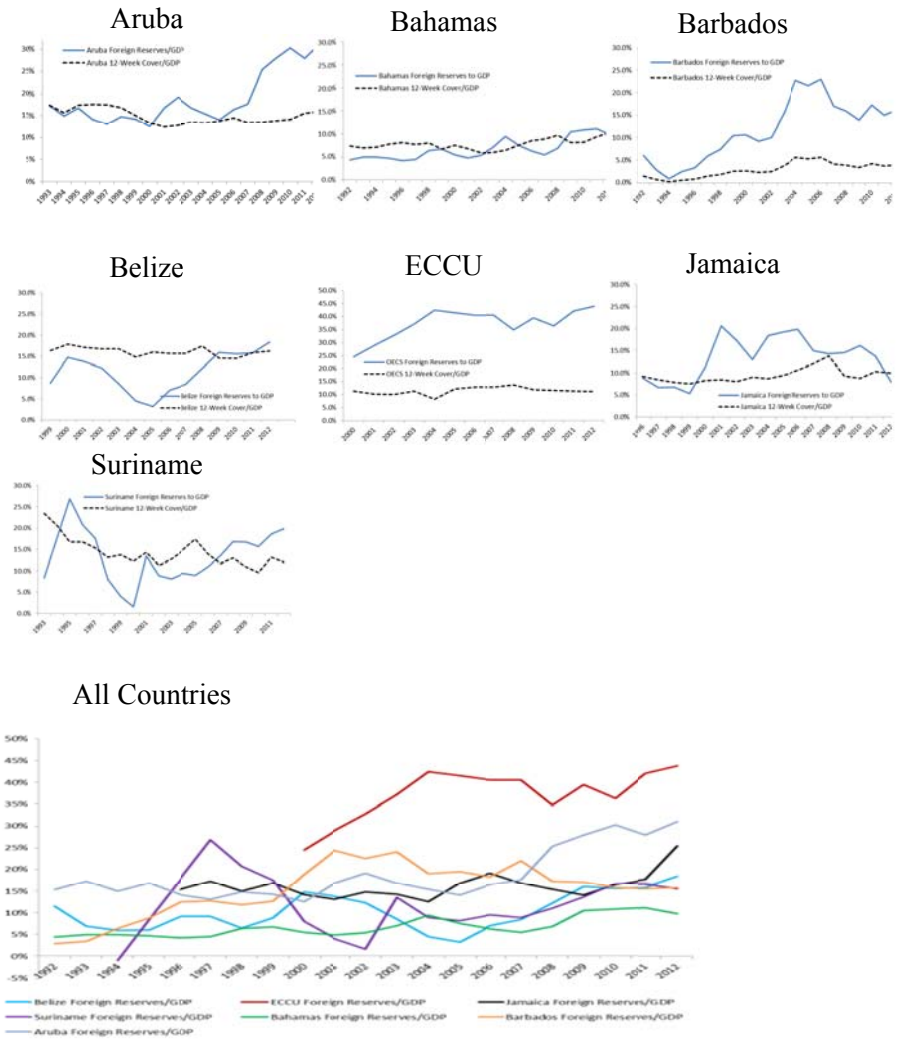
Next, we review the extent of money creation in these economies and how it has evolved over time. The patterns for most of the sample are not dissimilar: extensive periods of little or no central bank financing punctuated by periods of slightly higher borrowing and repayment in the following period(s). In The Bahamas, Barbados, the ECCU and Jamaica, increases in central bank credit to the public sector have averaged the equivalent of two per cent of GDP or less. In Belize, the central bank financing has been frequent and significant, generally equivalent to 3.5 per cent of domestic output. The largest levels of money creation, relative to GDP, have occurred in Suriname, which recorded two periods of financing in excess of 10 per cent of domestic output prior to 2000. Nevertheless, the levels have converged to the sample average over the past decade. Aruba stands out as the only country in the sample that has recorded no period of money creation since the 1990s.

Next, we apply our financing sustainability model to the sample group. First, we examine the historical impact of money creation on reserves by applying Equation 10 to the import, GDP and money creation data from the respective countries on an annual basis[14]. We then simulate the impact of money creation equivalent to two per cent and five per cent of GDP to observe what the retrospective effect on reserves

[14] In the case of Aruba, where there was no history of money creation, import elasticities were calculated based on the change in imports relative to changes in GDP.

would likely have been. This gives us a meaningful insight into the sustainability of past fiscal policy with respect to the binding constraint of reserves by identifying how much scope the respective central banks would have had to facilitate government financing without pushing reserves below the 12-week threshold.

Figure 29. Foreign Reserves to GDP

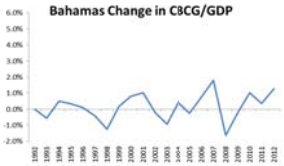


All Countries

Figure 30. Money Creation to GDP

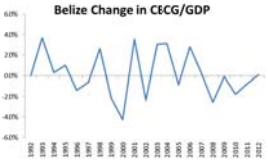
Aruba

Bahamas

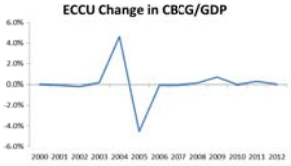


Barbados

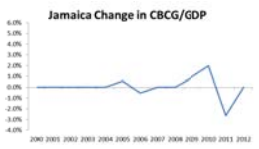
Belize



ECCU

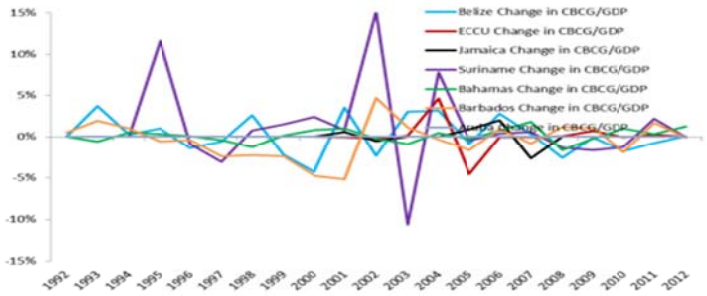


Jamaica



Suriname

All Countries



The charts in Figure 31 simulate the impact of money creation on reserves and reveal significant differences among the countries. The ECCU has been the most resilient, from a foreign exchange perspective, to additional levels of money creation. Simulations show that reserve levels would remain above the three-month threshold even in the event of money creation equivalent to five per cent of GDP, which is well above the average of 0.02 per cent for the Union and above the high of 4.7 per cent in 2004. Similarly, given the increased level of reserves relative to the threshold and the history of non-reliance on credit from the monetary authorities, simulations show that post-2006, Aruba could have withstood substantial levels of money creation while still maintaining the benchmark level of reserves. In Barbados, foreign exchange holdings have been well above the threshold and would have remained so in the case of money creation as much as two per cent of GDP. However, if net central bank credit to government were in the region of five per cent of GDP, the threshold would have been breached in four of the twelve periods.

In Suriname, there has been a distinct shift since 2007 as reserves, which were previously below the threshold, have exceeded the 12-week benchmark and have been adequate to guard against money creation of as much as five per cent of GDP. This suggests a very low level of risk, since money creation at these levels is unlikely given that the average over the period is approximately 0.7 per cent.

The simulations suggest that up until 2010, Jamaica's foreign exchange position appeared to have been relatively resilient to fiscal shocks that would require additional central bank financing. However, as reserves have declined, the country's susceptibility to fiscally-induced reserve challenges has increased.

As expected, given their historically low levels of reserves relative to the three-month threshold, The Bahamas and Belize have the highest risks under the framework and would be unable to intervene to finance Government's deficit without putting further pressure on reserves. As noted, however, there are some mitigating factors. The semi-dollarized nature of the Bahamian economy means that many transactions that require foreign exchange can (and are) executed without reliance on the Central Bank, thereby reducing the potential fall-out from brief periods of money creation.

Sustainability at end 2013

We then apply the model to project the expected impact of money creation for the period 2013. Again, using Equation 10, we use estimates for current period nominal GDP, a 10-year average import elasticity for each country and retain the unitary value for α. The results are displayed in Figure 32. We note that while the 12-week threshold is arbitrary, we use it because it happens to have wide currency. In practice policy makers in every country must take account of the trigger point which provokes uncertainty and capital flight in the foreign exchange market of that country.

The results suggest that the sample can be divided into three categories based on the extent of money creation needed to push them to this 12-week international benchmark: low, moderate and high risk. Most of the countries fall into the low risk group. Aruba, Barbados, the ECCU and Suriname can all sustain, at a minimum, money creation of five per cent of GDP before reaching the threshold.

It is important to note, however, that for the ECCU, this analysis should be examined in the context of a region with

governments that exercise different fiscal policies and have very different fiscal risks, despite the supranational fiscal rules. Given the available data, the analysis takes the ECCU in its entirety and is not able to identify vulnerabilities in specific countries within the Union.

Belize and The Bahamas fall into the moderate risk category. In these countries, any fiscal shock requiring central bank financing of under four per cent - in the case of Aruba – and 1.5 per cent in the cases of The Bahamas and Belize, would push reserves to the threshold. The risks in these countries are reduced, as noted above, either by their dollarized regimes or by a long-term history of zero money creation to finance government's operating deficit.

Within the sample, only one country – Jamaica – was at a high risk of foreign exchange distress, as its stock of reserves is below the threshold even before the iterative money creation is applied.

Figure 31. Impact of Money Creation on Reserves

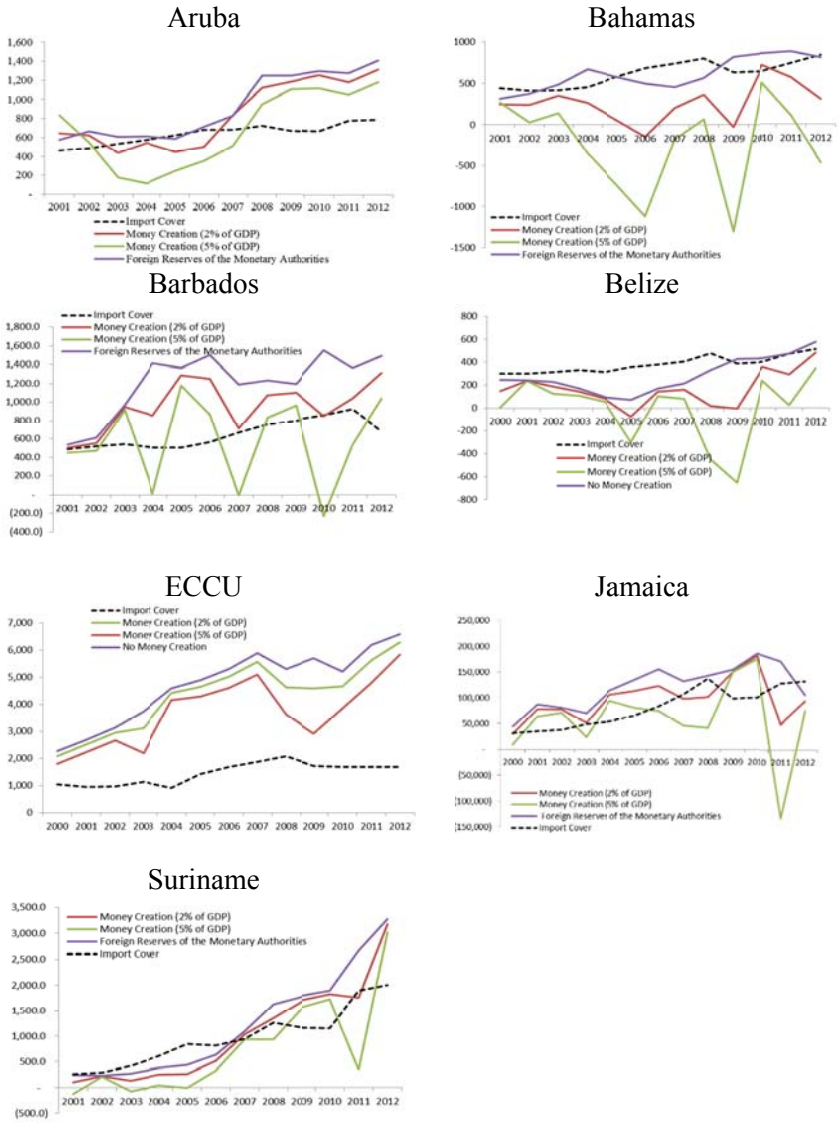
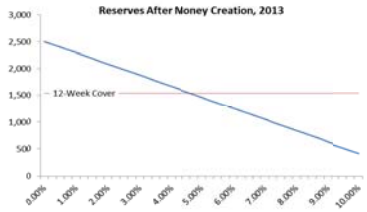
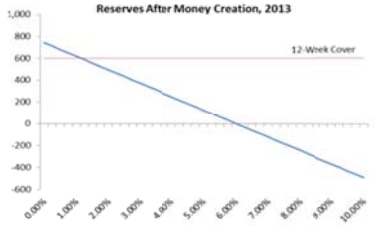


Figure 32. Impact of Monetary Authority Credit on Foreign Reserves

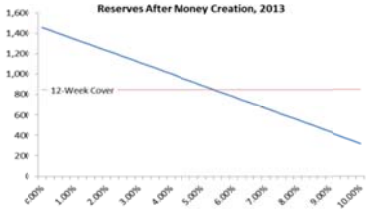
Aruba



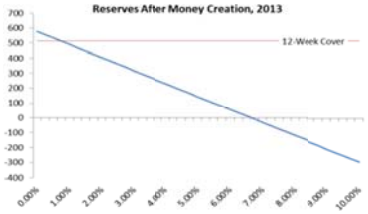
Bahamas



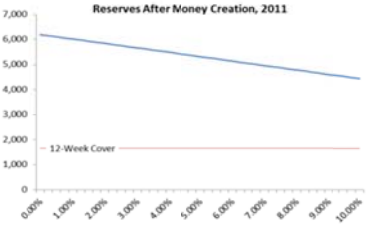
Barbados



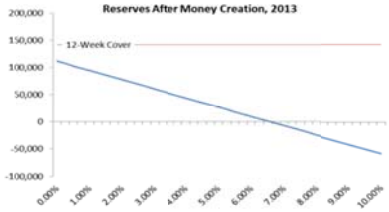
Belize



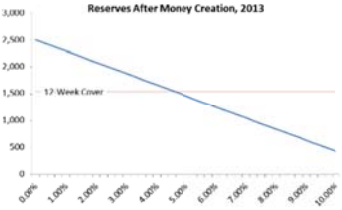
ECCU

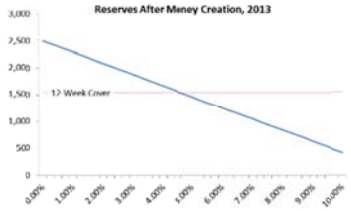


Jamaica



Suriname





Chapter 5

Fiscal Sustainability in the Caribbean

Although sovereign debt levels have risen across the Caribbean in the wake of the Great Recession of 2008, financial systems have displayed great resilience, and there has been no financial crisis anywhere in the region in the past six years. However, the region has struggled to contain fiscal deficits and to sustain fiscal consolidation strategies to address structural imbalances in Government finance. Widening deficits and slow growth meant that the overall ratio of sovereign debt to GDP rose to 98 per cent for the Caribbean countries covered by this study in 2014, compared with 106 per cent for industrial countries, 34.47 per cent for emerging economies and 37 per cent for Central America, the region's closest neighbour[15]. However, every country in the region has avoided the extreme foreign exchange losses, severe exchange rate depreciation and balance of payments crises that have characterised the Caribbean during similar episodes of external shock in the past four decades. That is prima facie evidence that the fiscal strategy pursued until now has been sustainable everywhere. Because our small economies are so open and import dependent, fiscal policy will always fail when it puts too much pressure on the external accounts,

[15] WEO data base, April 2014. Central America is the average for Costa Rica, Guatemala, Honduras, Nicaragua and Panama.

however fiscal deficits are financed. This structural reality of our economies allows us to make unambiguous judgements of fiscal sustainability to date, as well as to evaluate the risk of fiscal unsustainability going forward.

A characteristic of all small very open economies like those of the Caribbean is the fact that the link between fiscal policy inputs and outcomes in terms of growth and inflation runs through the balance of payments. Fiscal stimulus that is not financed by inflows always produces an excess demand for foreign exchange. If persisted with, exchange market pressure builds, the exchange rate depreciates, and the result is inflation rather than growth. Conversely, fiscal contraction retards growth and usually has no effect on inflation, because the improvement in the balance of payments is reflected in a build-up of foreign reserves, rather than an appreciation of the exchange rate. This economic relationship provides the tool that our study uses to assess the sustainability of fiscal strategies in the Caribbean. Fiscal strategy is unsustainable whenever it leads to a balance of payments crisis.

Can we say that the converse is true, that fiscal policy is always sustainable when there is little or no risk of a balance of payments crisis? Opinions remain divided on this, including among the authors of the present study, but what can be said with certainty is that the only objective measure of fiscal sustainability is linked to the threat of an external payments crisis. In particular, the popular notion that a debt-to-GDP ratio in excess of 100 per cent cannot be sustained is without foundation, in theory or in the experience of countries large or small, at any level of economic development.

The prevailing use of debt-to-GDP ratios as indicators of fiscal sustainability is pernicious because there is no correlation of the debt-to-GDP ratio with the risk of balance

of payments crisis. Such crises have occurred at low, medium and high debt-to-GDP ratios. On the other hand, many countries, large and small, have sustained high debt-to-GDP ratios for many years, without suffering a balance of payments crisis. What is more, policies aimed at reducing the debt-to-GDP ratio may in fact increase the risk of balance of payments crisis, if they undermine investor confidence. This is most evident in cases of default or contentious restructuring of existing debt. The loss of investor confidence is manifest in capital flight and a loss of foreign reserves.

The debt-to-GDP ratio continues in widespread use because the literature offers no other measure that has universal appeal. In efforts to extract better signals from the ratio, ratings agencies, the IMF and other international bodies and financial institutions have devised a bewildering menu of qualitative and quantitative indicators to accompany the debt-to-GDP ratio, in their analyses of sovereign debt. The variety and complexity of this plethora of methods and indicators has had the perverse effect of over-emphasizing the importance of the debt-to-GDP ratio, because it is the only variable that all approaches - except our own - have in common.

Over-emphasis on the debt-to-GDP ratio has the potential for inducing policy error, and misinforming financial markets about the extent of comparable risk among sovereign issues in the international capital market. With respect to policy, the countries that have reduced debt-to-GDP ratios most quickly are those that have experienced rapid bouts of inflation. The obvious policy implication, to provoke or to permit rapid inflation, makes no sense. Focus on debt reduction has also fuelled advocacy of policies that amount to the repudiation of debt obligations, in whole or in part. It has long been recognised that reneging on debt obligations does long term damage to the reputation of the sovereign, and

inhibits its ability to attract the inflow of capital necessary for the growth of the open economy. The current emphasis in some quarters on debt relief is therefore surprising, and entirely misplaced.

The focus on the debt-to-GDP ratio confuses sentiment in international markets and contributes to international financial instability. Countries with relatively high ratios are considered more risky, even when financial indicators show very low risk of balance of payments crisis. For small open economies this is clearly a misperception of the sovereign risk faced by the international investor.

The methodology we introduce in this paper enables anyone to make an objective assessment of sovereign risk with confidence. That is because in addition to the cost of servicing the foreign debt, we also take account of the impact on the balance of payments of fiscal stimulus and domestic financing of the deficit. We capture the impact on foreign reserves and the exchange rate of all the elements of fiscal policy, and their impact on aggregate expenditure and the demand for foreign exchange. Our approach also allows us to anticipate triggers that may precipitate damaging capital flight. If, at the end of this comprehensive assessment, the risk of a balance of payments crisis is low, the rational foreign investor should rate the sovereign favourably, whatever the debt-to-GDP ratio happens to be.

The absence of any reliable, objective indicators of fiscal sustainability is a major factor in the very high volatility of international financial markets since the Great Recession began. Investors are scared off countries with sound fundamentals and appropriate policies because their debt-to-GDP ratios have risen, and they are attracted to countries with low ratios, even when there is little appreciation of their

structures and policies, and the potential risk of balance of payments crisis that may affect the ability to service foreign currency debt. This distorts international market allocation and creates perverse investment incentives.

Fiscal sustainability in the Caribbean

In reviewing the experiences of Aruba, The Bahamas, Barbados, Belize, the ECCU, Jamaica and Suriname since the early 1990s, there is evidence of severe market pressure on the foreign exchanges in Barbados in the early 1990s, in Belize from the late 1990s onwards, in Jamaica in the late 1990s, and in Suriname up until 2007. In all of those periods the level of foreign exchange reserves was significantly below the informal benchmark, equivalent to 12 weeks of imports, for the country concerned. However, only in the cases of Barbados and Belize does it appear that fiscal policy was a major cause of the balance of payments disequilibrium. Barbados had witnessed an extended period of money creation in the late 1980s to finance large public deficits, while in Belize there were two extended periods of money creation, 1993-5 and 2001-6. Efforts to contract the supply of money in Belize in 1995-6 and 1999-2000 were insufficient to reverse the earlier expansion.

We confirmed that these were the countries and periods when fiscal sustainability was in question by testing the sensitivity of the foreign exchange markets of all the selected countries to fiscal expansion funded by additional money creation. The test indicates that, since 2000, Belize is the only one of the tested countries where additional fiscal pressure would have risked exhausting the stock of foreign reserves and precipitating a balance of payments crisis. We therefore conclude that there was some risk of fiscal sustainability in Belize up to the late 2000s, but that fiscal strategies appeared

to be sustainable everywhere else in the region, even with the impact of the international recession since 2008.

Looking ahead from December 2013, the risk of fiscal unsustainability appears to be low everywhere except in Jamaica. For Jamaica any additional money-financed fiscal expansion threatens to depress foreign reserves below a level which was already hovering around the 12-weeks-of-imports benchmark. We estimate that Aruba, Barbados, Belize, the ECCU and Suriname can all sustain money-financed fiscal expansion equivalent to five per cent of GDP or greater, and still maintain reserve levels above the 12-week threshold. In The Bahamas there is moderate risk of falling below the benchmark, but the country has no history of money creation, so the risk of unsustainable fiscal policy is low.

The inference we may draw from this analysis is that, with the possible exception of Jamaica, there is no evidence that the Great Recession has impaired the sustainability of fiscal policy in any of the countries we have researched, or in the ECCU as a whole. In Jamaica's case, there was some money creation in 2009-2010, but a sharp reversal was put into effect in 2011. Therefore, while there does appear to be some risk, there is evidence of determination to contain fiscal expansionary pressure.

The impact of the Great Recession on the Caribbean

As we saw in Chapter 3, none of the countries of CARICOM or the Dutch-speaking Antilles has experienced a financial or balance of payments crisis since 2008. The Great Recession did however worsen government revenues everywhere, and increased the already formidable challenges of fiscal consolidation. The Bahamas, Aruba and Suriname have emerged with the strongest fiscal performance indicators,

because they had the lowest debt ratios to begin with, at the time when the international recession hit. In the case of Suriname, Dutch financial assistance prior to 2008 contributed to the relatively favourable position. In Barbados and most countries of the ECCU, where fiscal indicators were weaker, authorities persisted with strategies for fiscal consolidation, while fully servicing debt obligations, both foreign and domestic.

Four countries, Jamaica (the second largest economy in the group) and Belize, St Kitts and Nevis and Grenada (less than five per cent of group GDP between them) opted to restructure debt as part of their fiscal adjustment strategy. In none of these cases does it appear, from the evidence that we have analysed, that the decision to restructure was driven by an inability to meet service obligations in full, as a result of the impact of the Global Recession. In all cases except Jamaica foreign currency reserves were more than adequate to take care of projected debt service, without depressing import cover below levels that markets viewed as adequate. The issue of foreign debt service capacity did not arise in the case of the Jamaica debt exchanges, which were limited to domestic currency obligations.

What is evident from the four restructuring episodes is that in no case was the government in imminent danger of a compulsory default on the obligations it chose to restructure. Rather, in each of these cases, government made a judgement that the long term cost of restructuring would be lower than the cost of additional adjustment that would have been necessary in order to fully service the outstanding debt.

It is in this sense that fiscal policy in CARICOM and the Netherlands Antilles can be assessed as sustainable. Countries have at all times had a choice of options, including debt

restructuring, and there has not been an example where default was imminent. In all of the four cases where debt restructuring was undertaken, the authorities could have chosen to fully service the debt, and to make other adjustments to the suite of policy measures. The fiscal policy could have been sustained and the servicing costs fully met, but government chose to restructure the debt rather than make the additional fiscal adjustments that would have been consistent with full debt service. The important question is whether that choice is in the best interest of long term development. It is that question, rather than fiscal or debt sustainability, to which priority should be attached. Our concluding remarks will offer some observations on this issue.

An objective measure of fiscal sustainability

Based on the use of our methodology, anyone may replicate our test of the sensitivity of the foreign exchange market to changes in fiscal policy, and confirm our conclusion: that there is little chance that current fiscal policies will lead to unsustainable pressure on the foreign exchange market, and a balance of payments crisis. There is no indication of a waterfall ahead on the river. Our test is based on observation of the actual economic relationships in the country in question: the impact of money creation on aggregate spending, the propensity to import, market perceptions of foreign reserve adequacy and the extent of financial integration with the wider world. Given these relationships, we are able to measure how far distant is the country from a balance of payments crisis under current fiscal policies, and how much additional money-financed fiscal stimulus could be tolerated before agents in the foreign exchange market were to become convinced that a balance of payments crisis was imminent, and seek to exit with their capital. Although we do not go so far in our study, it is also possible to estimate the

probability of a crisis, with the help of stochastic estimates of the applicable parameters.

We know of no other approach that provides an objective test of the distance to default of fiscal and debt strategies. In theory fiscal policy is sustainable when Government's budget may be financed without default or excessive monetisation that leads to high inflation. The literature reviewed in Chapter 2 illustrates the many efforts to derive from this bald statement a useable measure of the distance to default; they all suffer from insurmountable difficulties of concept and interpretation. The Present Value Budget Constraint approach requires value judgements about the starting point, the rate of time preference and the potential rate of growth. The theoretical model has an infinite horizon, and offers no insight as to the path of debt and deficits over time. In Chapter 2 we note studies that have attempted to find an upper limit for debt and deficits, and others that have tried to develop a measure of "fiscal space", but none appears to be convincing. Other theoretical approaches, such as those based on models with infinitely lived individuals, and intergenerational equity, are too abstract to yield useful guidance in the real world. In the absence of anything better, policy makers and empirical researchers are forced to rely on indicators and rules of thumb.

Empirical studies that use the PVBC and other theoretical approaches suffer from the inherent weaknesses of those approaches, as well as the fact that the tests do not measure actual behaviour, and inferences must be drawn from features such as the apparent convergence of variables. A more promising approach employed in some countries estimates a probability of default from forecasts of a structural model. This approach is compatible with our own methodology. However, the approach does not have a clear trigger point

similar to the minimum foreign reserve cover in our model. DSGE models have also been used to assess fiscal sustainability, but they suffer problems of arbitrary parameterisation and far-fetched assumptions.

In the end, the evidence from Chapter 2 suggests that international financial markets depend on simple indicators of risk, and the one indicator they all share is the debt-to-GDP ratio, which assumes an importance that bears no relation to its accuracy in measuring distance to default. This ratio is always hedged about with other indicators and qualitative judgements, so numerous and influential that they overwhelm any inference from the debt-to-GDP ratio. As a result, countries with similar debt-to-GDP ratios are assessed to have radically different sovereign risk profiles, according to conventional analyses such as the IMF's Debt Sustainability Analysis methodology.

The implications for policy in the Caribbean

Fiscal policy should be consistent with balance on the external account. The achievement of balance on the external account, with levels of foreign reserves which the financial markets consider to be adequate, minimises the likelihood of a balance of payments crisis. In the absence of a balance of payments crisis, the risk of default on foreign debt is low, as is the risk of capital flight. When there is no capital flight, the risk of compulsory default on domestic debt is also low. So long as financial resources remain within the domestic currency space, government may compete or tax them away from the private sector.

1. Governments should be extremely wary of debt restructuring and debt relief.

Any modification of sovereign obligations has the potential to damage market perceptions of the credit worthiness of the borrower. That immediately raises the cost of future borrowing, and therefore reduces the potential rate of growth in open economies where FDI is a significant proportion of capital formation. Debt modification should be embarked upon as a last resort, and only in cases where the benefits clearly outweigh the cost, in terms of future growth.

2. Measures of exchange market pressure should replace debt-to-GDP ratios as the trigger for fiscal correction.

Excessive exchange market pressure (rapid loss of foreign reserves, unexpected depreciation of the exchange rate) is an unambiguous signal of a need for action to correct the excess demand for foreign exchange. That demand is very insensitive to exchange rate changes in economies where food and fuel are largely imported, and monetary policy is made powerless in these circumstances by capital flight. Fiscal policy is the only policy tool that will contain aggregate demand - and therefore the demand for foreign exchange - and restore the credibility that can arrest the flight.

To date, there is no credible way of establishing the likelihood of financial distress if there is no excess demand for foreign exchange. In particular, neither a high debt-to-GDP ratio, nor a rapid increase in that ratio, is a dependable indicator of financial difficulty, in the absence of excessive external market pressure.

It is potentially damaging to growth prospects to restructure debt or to seek debt relief in order to reduce the debt-to-GDP ratio. The lowering of the ratio *per se* serves no economic function, whereas attempts to modify outstanding debt may reduce growth potential.

A focus on reducing the debt-to-GDP ratio, rather than on exchange market pressure, may encourage policies that are inflationary. As we observed earlier, a high rate of domestic inflation will have the most powerful impact in reducing the ratio.

3. Unsustainability is not the only reason for fiscal correction, but it is the most urgent.

There are many reasons why a change of fiscal policy may be necessary: governments may be too large, not sufficiently productive, the delivery of government services may be inefficient, the scope of government activity too wide, government may be crowding out the private sector, tax rates may be too high. These are all structural issues that can be addressed in a planned fashion, and implemented over time. In contrast, where evidence of unsustainability shows up on the external accounts, immediate action is called for. That is why it is vital to distinguish between fiscal strategies that are not sustainable, and those that may not be optimal. When sustainability is at issue, time is of the essence.

Fiscal sustainability and financial market intelligence

The risk that concerns investors on the financial markets, at home and abroad, is the distance from default, which is the probability that fiscal policy will have an outcome which makes it impossible for the borrower to fully meet their debt obligations. In other words, investors want to know whether there is an unacceptably high risk of unsustainability. Our methodology provides an objective measure of unsustainability, and therefore it is a more reliable alarm bell for investors than any to be found in the literature.

It is a strong point of our approach that it does not depend on a debt-to-GDP ratio, because that ratio proves to be a poor indicator of the distance to default implicit in any fiscal strategy. Unfortunately, the investment community continues to treat the debt-to-GDP ratio as the main indicator of default risk, for want of an alternative that is of general application. Our sustainability test, based on the external vulnerability of small open economies, provides an alternative way of assessing default risk for the Caribbean and countries of similar size and structure.

Concluding observation

Countries of the Caribbean Community and the Netherlands Antilles face a variety of fiscal challenges which call for fiscal consolidation in all the countries we have analysed in this study. However, unsustainability of the fiscal or debt strategy is not among these challenges in any of the countries. In all cases the distance from debt default is long, and the risk low, when judged by the impact of the fiscal strategy and its financing on the external balance and the foreign exchange market pressure. The overall debt-to-GDP ratio for the region is not especially high by international standards, even though two countries, St Kitts and Nevis and Jamaica, have exceptionally high ratios, but in any event the ratio tells us nothing about the risk of default in the region. Although both Jamaica and St Kitts and Nevis chose to restructure debt, in neither case were they compelled to do so because there were no other options. In all four cases of debt restructuring in the countries of our sample since 2008, the authorities had other options.

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Appendix

Table A4.1 Belize Debt Instruments Restructured

Table A4.2 Belize Comparison of 2007 and 2013 Debt Restructuring

Table A4.3 ECCU Stylized Facts

Table A4.4 ECCU Real GDP Growth (per cent)

Figure A4.1 ECCU's Inflation

Table A4.5 ECCU Fiscal Performance (per cent of GDP)

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Figure A4.2 ECCU Weighted Average Interest Rates: ECCU

Figure A4.3 External Performance Average: 2002-2012

Figure A4.4 International Reserves: ECCU

Figure A4.5 Reserve Adequacy Indicators

Table A4.1: Belize Debt Instruments Restructured

Type of Claim	Final Maturity	Principal Amount as of Nov. 30, 2006
Bear Stearns 9.50% Note	2012	US$125.0mn
Bear Stearns 9.75% Note	2015	US$100.0mn
RBTT 9.50% Fixed rate Bond	2010	US$25.6mn
RBTT 9.95% Fixed rate Bond	2014	US$76.1mn
Citicorp 9.75% Fixed Rate Bond	2007	US$1.4mn
Citicorp 9.75% Fixed Rate Bond	2008	US$2.6mn
Citicorp 8.95% Fixed Rate Bond	2013	US$17.5mn
The International Bank of Miami Yield compensation Note	2010	US$0.6mn
The International Bank of Miami Tranche Note	2010	US$22.0mn
The International Bank of Miami 9.25% Note	2011	US$12.0mn
The International Bank of Miami 10.0% Note	2012	US$18.0mn
Belize Sovereign Investment I	2015	US$65.2mn
Belize Sovereign Investment II	2010	US$50.0mn
Venezuela	2023	US$50.0mn

Table A4.2: Belize Comparison of 2007 and 2013 Debt Restructuring

	2007	2013
NPV Features of the Bond	27.7% Reduction	43.3% Reduction
Step-up Coupon Structure	• 4.25 % in the first 3 yrs. • 6.00% in the next 2 yrs. • 8.50% thereafter	Step-up Coupon Structure 5.0000 % thru' August 2017 6.6780 % thereafter
Repayment	• 20 equal, semi-annual installments • beginning August 2019, and maturing February 2029	Repayment • 38 equal, semi-annual installments • beginning August 2019, and maturing February 2038
International Support	Support from IMF, IDB and CDB	No support from international agencies
	98.0 per cent of the affected debt was restructured	86.2 per cent participation
Tendered	Use of Collective Action Clause (CAC)	Use of Collective Action Clause (CAC)
Debt Reduction	Various Commercial Instruments were substituted by a single US Dollar Bond - 'Super-bond'. Outstanding Debt remained the same.	Exchanged the 2029 bond with a new bond maturing 2038. A 10.0 per cent haircut on the outstanding debt was obtained.

Table A4.3: ECCU Stylized Facts

Indicator	**Pre-Crisis Period: 2002-2008**	**Crisis Year: 2009**	**Post-Crisis Period: 2010-2012**
Growth (average *real GDP)*	Peaked at 10.7%	Depressed to -4.2%	Peaked at 2.8 %
	Growth was influenced by value added in the construction, hotel and restaurant and agricultural sectors.	Growth was influenced by value added in the constructi on.	Growth was influenced by value added in the construction, hotel and restaurant.
Overall Fiscal Deficit (*consolidated)*	Narrowed to 2.5% of GDP	Widened to 5.2% of GDP	Narrowed to 1.1% of GPD
	Antigua and Barbuda (2006), Dominica (2006) and St Vincent and the Grenadines (2007) implemented Value Added Tax (VAT). Income tax was reintroduced in Antigua and Barbuda (2005).		VAT was introduced in Grenada and St. Kitts and Nevis. Antigua and Barbuda increased fees on: stamp duties and embarkation tax.

Table A4.3: ECCU Stylized Facts (Continued…)

Indicator	**Pre-Crisis Period: 2002-2008**	**Crisis Year: 2009**	**Post-Crisis Period: 2010-2012**
Public Debt	Dominica, Grenada, Antigua and Barbuda and St Vincent and the Grenadines tackled high debt through debt restructuring/debt forgiveness	The composition of public debt shifted moderately in favour of domestic debt.	* All independent states debt-to-GDP exceeded 60%. * St Kitts and Nevis undertook debt restructuring.
External Sector	External current account deficits in the ECCU have been typically large and persistent.		Gross international reserves increased more than two-fold to US$981.0mn at-end 2012. The expansion has been persistent since 2009.
Monetary	Enactment of anti-money laundering legislation, the establishment of financial intelligence units and the issuance of anti-money laundering guidelines.		
Vulnerability	High exposure to economic shocks external shocks, natural disasters and fiscal imbalances.		
Inflation	Peaked at 6.2%	0.01 %	

Table A4.4: ECCU Real GDP Growth (per cent)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Antigua and Barbuda	2.90	6.58	4.91	6.11	12.91	9.50	0.07	(12.04)	(7.14)	(2.82)	2.33
Dominica	(2.13)	7.39	3.03	(0.82)	9.51	5.96	7.82	(1.13)	1.20	1.01	(1.45)
Grenada	3.65	9.64	(1.03)	13.52	(4.70)	6.12	0.95	(6.66)	(0.35)	0.97	(0.8)
St. Kitts and Nevis	1.91	(1.45)	4.36	9.86	5.78	2.83	4.62	(6.01)	0.23	1.69	(1.07)
St. Lucia	0.11	4.45	8.40	(1.89)	8.57	1.62	5.11	0.36	0.23	1.39	(3.04)
St. Vincent and the Grenadines	6.26	7.58	4.16	2.46	7.63	3.30	1.62	(2.29)	(3.35)	(0.67)	1.52
ECCU	2.47	4.45	6.44	8.76	10.50	10.73	5.16	(4.23)	(1.07)	1.66	2.76

Source: Eastern Caribbean Central Bank.

Figure A4.5: ECCU's Inflation

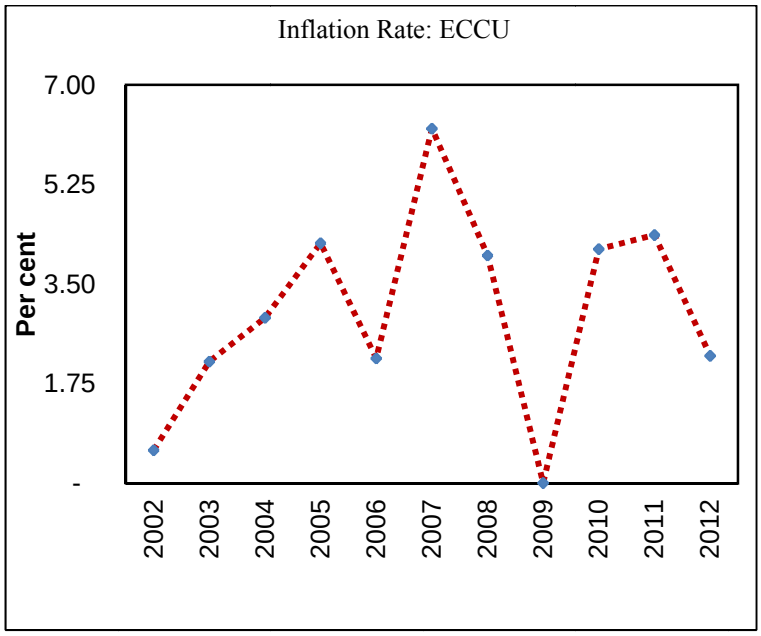


Table A4.6: ECCU Fiscal Performance (per cent of GDP)

Country	Current Revenue	Current Expenditure	Capital Expenditure	Total Interest Payments	Overall Balance (after grants)	Primary Balance (after grants)	Fiscal Stability Ratio
Antigua and Barbuda:							
2002-08	19.3	22.3	4.6	5.7	(7.6)	(3.0)	(1.2)
2009	18.3	24.0	5.5	4.7	(18.	(11.	(1.6)
2010-12	20.3	22.2	1.5	3.2	2) (1.7)	0) 0.7	(1.1)
Dominica:							
2002-08	25.3	24.6	7.5	5.7	(2.6)	1.6	(1.1)
2009	26.9	22.2	11.6	18.	(2.1)	1.0	(1.1)
2010-12	27.4	25.4	13.0	3.9	(9.1)	(2.4)	(1.3)
Grenada:							
2002-08	20.0	17.9	10.9	4.5	(4.6)	(2.7)	(1.2)
2009	19.3	20.0	5.6	3.7	(4.9)	(3.8)	(1.3)
2010-12	20.0	20.4	5.5	4.5	(3.7)	(0.6)	(1.2)
St. Kitts and Nevis:							
2002-08	27.0	27.3	6.5	8.9	(4.6)	3.9	(1.2)
2009	28.0	28.5	5.0	8.6	(1.0)	5.0	(1.0)
2010-12	30.1	28.0	4.7	8.2	3.1	4.1	(0.9)

Source: Eastern Caribbean Central Bank.

Table A4.6: ECCU Fiscal Performance (per cent of GDP) (Continued…)

Country	Current Revenue	Current Expenditure	Capital Expenditure	Total Interest Payments	Overall Balance (after grants)	Primary Balance (after grants)	Fiscal Stability Ratio
St. Lucia:							
2002-08	23.4	19.7	7.7	4.2	(3.0)	(0.4)	(1.1)
2009	24.5	21.0	6.4	4.3	(3.1)	(0.4)	(1.1)
2010-12	24.7	23.6	6.8	4.6	(7.9)	(4.6)	(1.3)
St. Vincent and the Grenadines:							
2002-08	24.0	21.5	6.0	3.5	(2.2)	(0.7)	(1.1)
2009	25.6	25.8	5.8	4.0	(1.7)	(0.5)	(1.1)
2010-12	25.2	25.9	3.5	3.7	(2.5)	(3.6)	(1.1)
ECCU-six:							
2002-08	21.1	20.4	6.6	5.0	(3.3)	0.3	(1.1)
2009	21.6	21.9	5.8	4.3	(5.2)	(1.6)	(1.2)
2010-12	22.6	22.4	4.9	4.3	(3.6)	(1.1)	(1.1)

Source: Eastern Caribbean Central Bank.

Table A4.7 ECCU Debt Decomposition (Authors' calculation)

Country	Initial Debt-to-GDP Ratio (2002)	End of Period Debt-to-GDP Ratio (2012)	Cumulative Percentage Point Change (2002-2012)	Main Contributing Factors: Cumulative (per cent of GDP):	
				To Increase in Debt-to-GDP Ratio	***To Decrease in Debt-to-GDP Ratio***
Antigua and Barbuda	127.5	97.8	(15.0)		Real GDP growth [-15.2], Endogenous factors [-8.2]
Dominica	99.2	72.3	(28.6)		Primary surplus [-25.3], GDP growth [-18.9]
Grenada	78.5	105.4	61.0	Primary deficit [48.1], Interest rate [13.0]	

Table A4.7 ECCU Debt Decomposition (Authors' calculation) (Continued…)

Country	Initial Debt-to-GDP Ratio (2002)	End of Period Debt-to-GDP Ratio (2012)	Cumulative Percentage Point Change (2002-2012)	Main Contributing Factors: Cumulative (per cent of GDP):	
				To Increase in Debt-to-GDP Ratio	***To Decrease in Debt-to-GDP Ratio***
St. Kitts and Nevis	120.5	144.9	39.1	Interest rate [26.8], Growth/ Interest differential [12.9]	
St. Lucia	59.5	78.7	31.0	Interest rate [26.8], Endogenous factors [13.5]	
St. Vincent and the Grenadines	57.2	68.3	12.1	Interest rate [19.2], Endogenous factors [10.5]	

Figure A4.8: ECCU Weighted Average Interest Rates: ECCU

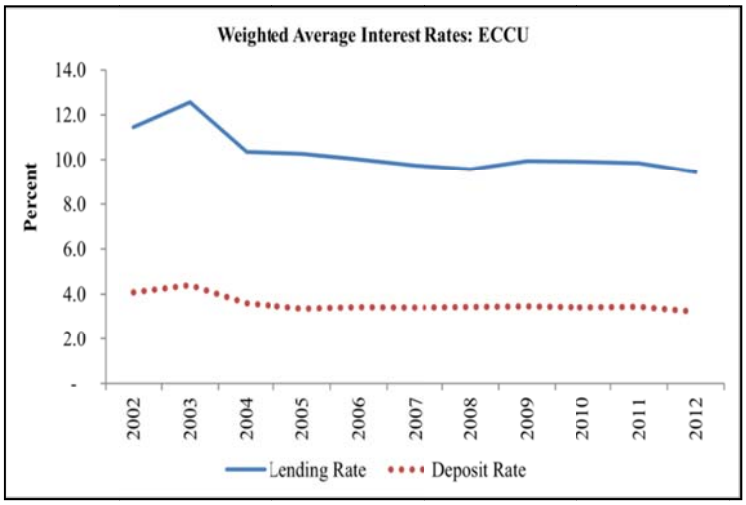


Figure A4.9: External Performance Average: 2002-2012

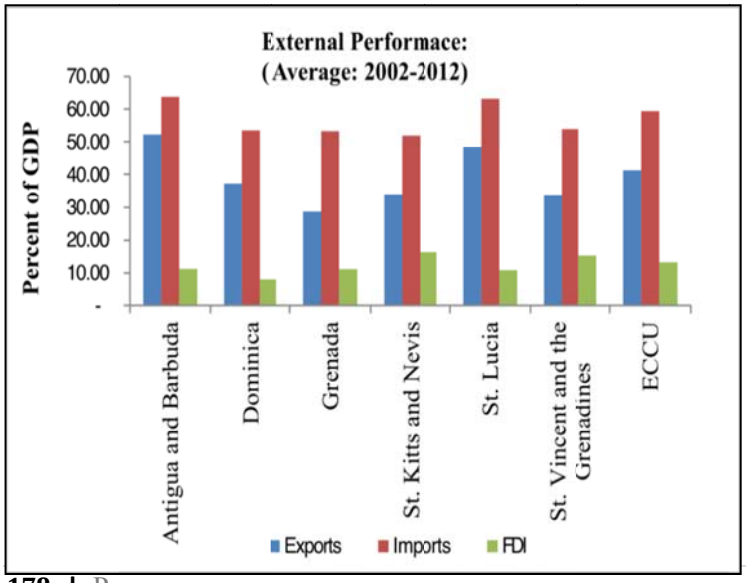


Figure A4.10: International Reserves: ECCU

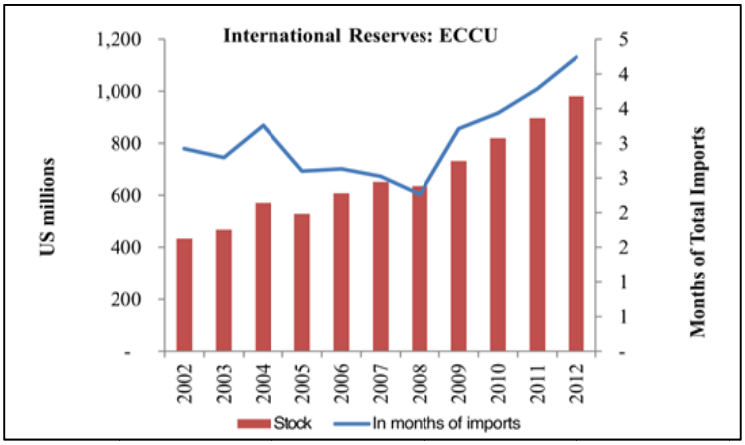
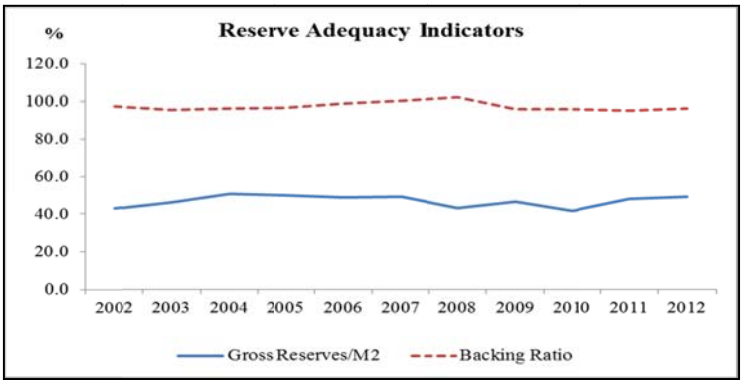


Figure A4.11: Reserve Adequacy Indicators



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