

## **THE EFFICIENCY OF GOVERNMENT EXPENDITURE IN THE CARIBBEAN**

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The issue of expenditure efficiency is an important policy issue in the Caribbean given the dominant role of the state in the economy, the significant increase in government expenditures in the region and the weak fiscal position of most Caribbean sovereigns. The trend increase in government expenditures is driven in large part by significant increases in public sector wages, subsidies and capital expenditures. Rebalancing the share of each component in total expenditure and improving the management of these expenditure components could significantly increase government expenditure efficiency. This can help to loosen the budget constraint by achieving more for a given level of resources or achieving the same outcomes for a lower level of resources. Studies on public expenditure efficiency in the Caribbean, however, to date only provide indicative guidelines such as that capital expenditure seems to be more productive since it appears to be growth enhancing. What is needed is a benchmarking of the inputs (expenditure) by the benefits derived (output) which is central to the concept of efficiency, as well as a disaggregated evaluation of the efficiency of different expenditure components so that informed decisions can be made as to which components can be cut without damaging growth prospects in the context of much needed fiscal consolidation. We use a non-parametric efficiency frontier technique to evaluate this issue for a range of expenditure components for select Caribbean countries. We find that there are significant efficiency differences across countries and there is much scope for improvements in expenditure efficiency in the Caribbean.

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## 1.0 Introduction

Over the period 1960 to 2010, the rate of growth of Caribbean economies as a group has been consistently better than Latin America with growth of per capita GDP averaging approximately 2.4% compared to 1.8% in Latin America but lower than the 5.4% recorded by the more dynamic economies in the East Asia and Pacific region. Over this period the region has undergone tremendous change in terms of a general move away from dependence on agriculture to more service based economies, the greater integration into the global economy and the attendant increased vulnerability to external shocks and increased competition from more efficient producers and, the increased size of the state as the government sought to meet a myriad set of needs. There has also been a worrying trend of declining growth rates in the Caribbean since the end of the 1970s, with growth in per capita GDP moving from an average of 3.9% in the 1970s to 1.6% in the first ten years of the 21<sup>st</sup> century.

**Table 1: Per Capita GDP Growth in CARIFORUM Member Countries (%) 1960-2010**

Country/Region	Years					1960-2010
	1960s	1970s	1980s	1990s	2000s	
Antigua and Barbuda	na	na	6.30	2.20	1.42	3.31
Bahamas, The	5.40	0.04	1.60	-0.20	-0.43	1.28
Barbados	6.00	3.00	1.90	0.50	-0.09	2.26
Belize	2.20	4.40	2.80	3.50	1.51	2.88
Dominica	na	na	6.30	2.40	2.32	3.67
Dominican Republic	1.60	5.40	1.50	2.80	3.86	3.03
Grenada	na	na	4.70	2.70	1.67	3.02
Guyana	1.30	0.90	-2.50	4.50	1.83	1.21
Haiti	-1.30	1.80	-1.50	-3.20	-1.24	-1.09
Jamaica	2.70	-0.20	0.20	0.60	0.52	0.76
St. Kitts and Nevis	na	na	6.50	3.90	0.50	3.63
St. Lucia	na	na	4.30	3.30	1.08	2.89
St. Vincent and the Grenadines	-0.20	17.70	4.80	3.00	2.80	5.62
Suriname	na	2.70	-1.70	0.40	3.27	1.17
Trinidad and Tobago	3.50	3.50	-2.50	2.20	5.37	2.41
Caribbean	2.30	3.90	2.20	1.90	1.62	2.38
Latin America and Caribbean	2.40	3.30	-0.20	1.20	2.12	1.76
East Asia and Pacific (EAP)	1.80	5.00	5.70	6.20	8.08	5.36
Caribbean Growth Gap to EAP	-0.60	1.10	3.50	4.30	6.46	2.95

Sources: 1. World Bank: A Time to Choose: Caribbean Development in the 21<sup>st</sup> Century, 2005; 2. World Bank, World Development Indicators 2011; and author's calculations.

Many countries in the region have also suffered serious bouts of macroeconomic instability which tended to be correlated with periods of low growth<sup>1</sup>. In particular, Trinidad and Tobago and Suriname suffered serious instability in the 1980s, with The Bahamas and Barbados going through a period of serious macroeconomic instability in the 1990s. Both the Bahamas and Barbados have also experienced weakness in their fiscal accounts with the attendant increases in the debt overhang in the recent past, especially in the wake of the most recent global economic and financial crisis. Trinidad and Tobago has also seen its debt burden increase as it has recorded

<sup>1</sup> The Caribbean experience appears to vindicate the widely held view that that macroeconomic instability negatively affects growth (Bleaney, 1996, Fischer, 1993 and Sirimaneetham and Temple, 2009).

deficits since 2009 driven by falling revenues and expenditures that have proven difficult to adjust downwards in the wake of the recent international financial crisis. In the case of Jamaica, macroeconomic instability has occurred regularly over this period with the most serious crisis being the banking crisis and its related effects in the 1990s.

In all cases fiscal imbalances tended to be at the centre of these crises usually as the catalyst but often as the result of financial instability. These fiscal imbalances have been caused over time by slow growth driven by difficult international economic conditions, the prevalence of weather related natural disasters, under-developed systems (especially tax systems) for the administration of public finances, the need to develop the fill the infrastructural gap, unproductive public expenditures especially around elections and of late fiscal stimulus in the form of elevated government expenditures to counter slowing private demand. Governments' expenditure programmes are therefore a critical element in the public finance dynamic and its relation to economic growth is critical to sustainable development. In particular, the extent to which governments' expenditure programmes are productive or efficient have huge implications for the strength of the fiscal accounts and economic growth prospects.

This paper seeks to evaluate the efficiency of government expenditure in select Caribbean countries with a view to providing a more informed basis on which the needed fiscal consolidation efforts can be implemented on the expenditure side. The paper is structured as follows; section 2 examines the policy issues related to fiscal consolidation in general and the need for more efficient government expenditure programmes in particular, section 3 reviews the literature on the efficiency of government expenditure, section 4 outlines some of the results from the efficiency analysis and section 5 concludes.

## **2.0 Policy Discussion**

The issue of expenditure productivity is an important policy issue in the Caribbean given the dominant role of the state in the economy, the increased demand for public and social services, the fiscal costs associated with the resolution of financial crises, disaster mitigation related spending and revenue constraints. The issue of expenditure productivity is, however, inextricably linked to the issue of how public expenditure impacts on economic growth<sup>2</sup>. Indeed, the fact that in spite of relatively high public expenditure in the region, economic growth remains very low in many jurisdictions has been one of the main factors driving interest in increasing expenditure productivity in the Caribbean. The World Bank study, *Caribbean Development in the 21<sup>st</sup> Century* identified one of the main reasons for this as unproductive public investments. This study suggested that high government spending and the associated high tax burden when coupled with poor service delivery restrains growth. This dynamic is compounded when high debt levels begin to raise concerns about sustainability which leads to uncertainty and low business confidence.

Government expenditure levels in the Caribbean countries being reviewed have increased over time and their expenditure to GDP levels tend to be closer to the level of industrial countries rather than their counterparts in Central America and comparators such as Mauritius (World Bank

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<sup>2</sup> There are mixed evidence with respect to the impact of public finance on growth (Easterly and Rebello, 1993, Devarajan *et al.*, 1996)

2005). This reflects in part the relatively high per capita GDP for these countries and the fact that these are vibrant democracies where the authorities are responsive to the needs of the country in terms of social services and infrastructure. This trend increase in government expenditures is driven in large part by increases in public sector wages, subsidies and transfers and capital expenditures. In particular, wage costs and transfers and subsidies have grown strongly as the role of the state in the economy expanded in the Caribbean often at the expense of capital expenditure. Interest costs in some highly indebted jurisdictions, notable Jamaica, have also crowded out capital expenditure. Rebalancing the share of each component in total expenditure and improving the management of these expenditure components could therefore significantly increase government expenditure productivity<sup>3</sup>. Increasing the efficiency of government expenditures can help to loosen the budget constraint by achieving more for a given level of resources or achieving the same outcomes for a lower level of resources (Mandl et al., 2008). Improving expenditure productivity is therefore one of the ways to contain the problem of persistent fiscal deficits in the region while ensuring that the allocations for growth enhancing expenditures are sufficient<sup>4</sup>. Increasing expenditure efficiency can at the margin help to eliminate waste, increase allocative efficiency and sustain growth.

Real expenditure increases have also tended to be pro-cyclical, resulting in deteriorating fiscal and debt dynamics. In this environment, the need for fiscal consolidation has been a priority but present circumstances require consolidation at a time when economic growth is weak and after a period where the authorities have for years been adjusting largely on the revenue side and expenditure is now politically difficult to cut, especially subsidies and social expenditures.

The policy advice from the IFIs has also focused consistently in the Caribbean on limiting recurrent expenditure, particularly expenditure on wages and transfers and subsidies to create space for capital expenditure<sup>5</sup>. The assumption underlying these recommendations seems to be that capital expenditure is more productive than recurrent expenditures. A larger proportion of government expenditure allocated to capital expenditures would therefore promote growth and fiscal sustainability. Indeed, the budget statements of the authorities in Caribbean jurisdictions over time indicate that they also viewed capital expenditures as more productive than recurrent expenditure. The experience of the last decade has been, however, that recurrent expenditures have been difficult to control and adjustments have often targeted capital expenditures. This was not due to the authorities believing that these expenditures were not productive but simply because it was easier to cut expenditure in this area than the politically sensitive areas of wages and subsidies<sup>6</sup>. When we move away from these broad economic classifications of government expenditure to focus on specific functional areas, it appears that more resources are being devoted to education and health but transport and communications and expenditure on infrastructure seem to have suffered in many countries. The fact that much of the increases in

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<sup>3</sup> A point made in many IMF Article IV consultations with the national authorities of the five countries reviewed.

<sup>4</sup> Many studies have advocated that fiscal consolidation programmes, especially those based on expenditure cuts rather than tax increases, can be growth enhancing (Giavazzi and Pagano, 1990 and 1996; Alesina and Perotti, 1995 and 1997 and; Alesina and Ardagna, 1998 and 2010). Recent work most notably by the IMF (2010) have, however, strongly refuted these claims noting that consolidation based on spending cuts is less damaging to growth in the short run compared to tax increases but all consolidation efforts reduces growth in the short run, especially if done in depressed economic conditions.

<sup>5</sup> See IMF, Article IV Consultation Report, various years.

<sup>6</sup> These components are often very aptly referred to as non-discretionary spending.

education and health in the Caribbean are related to subsidies imply that in a Caribbean context these components may not be as productive as suggested by many studies.

In this regard, differentiating between productive and unproductive government expenditures and trying to minimize the latter in the context of fiscal sustainability should be a top priority of authorities in the region, given the limitations on the revenue side for the foreseeable future due to weak growth. The need for the better management of expenditure programmes has led to the increasing popularity of public expenditure management (PEM)/performance budgeting programmes given the unsatisfactory outcomes from conventional budgeting approaches (Schick, 1999). These programmes essentially aim to improve the allocative and productive efficiency in public expenditure (Robinson and Brunby, 2005). A major part of these programmes is identifying those expenditures which are the most unproductive which is in itself a major challenge but the biggest challenge is to stop these types of expenditure since the beneficiaries of these expenditures are often well connected politically. Once this is done the remaining expenditures must be prioritized and then there must be tight cost controls on projects to be implemented.

Public expenditure efficiency is also generally lower in commodity based economies such as Suriname and Trinidad and Tobago and this is due in large part to the fact that commodity revenues pass directly to the government rather than through the tax system which was initially income in the hands of citizens. The discipline of justifying expenditure programmes to taxpayers imposes a level of scrutiny and restraint that is not normally the case with commodity producers which seems to result in less caution on the expenditure side (Devarajan, Minch Le and Raballand, 2010). The challenges of increasing the efficiency of public expenditure in these economies are therefore much greater and hinge on fostering transparency and accountability.

### **3.0 Evaluating the Efficiency of Government Expenditure**

One way of assessing the productivity of government expenditure is to determine whether expenditures are growth enhancing or not, with expenditures which have a positive impact on growth classified as productive and non-productive expenditure classified as those which have a negative impact on growth. Studies that look at the link between the components of government expenditure and growth (Aschauer, 1989, Barro 1991, Easterly and Rebelo 1993) have highlighted the distinction between those expenditures that feed into the utility function of households and may only increase consumer welfare and those that complement the production function of the private sector and therefore are growth enhancing. Current expenditures on transfers and subsidies, for instance, may improve households' welfare but may tend to depress growth because of the higher taxes needed to finance consumption expenditure. Alesina and Perotti (1995) and IMF (2010) also suggest that spending cuts are less contractionary if they target transfers and wages rather than capital expenditures.

On the other hand, the results of a study by Devarajan et. al. (1996) focusing on developing countries suggest that current expenditure was growth enhancing while capital expenditures lowered growth<sup>7</sup>. When the methodology was applied to developed countries, however, the results conformed to the traditional view that capital expenditure was growth enhancing while

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<sup>7</sup> Ghosh and Gregorieu (2006) also find similar results.

current expenditure was not. They argued that usually productive expenditures could be inefficient if there is excessive use of these expenditures, meaning that developing countries may have been misallocating resources with too much of public expenditures going to capital expenditures and too little to current expenditures<sup>8</sup>. It may also be that the inefficiencies associated with public sector investment programmes in developing countries may negatively affect growth. For example, the building of vanity projects which add to national debt and future tax burden without a countervailing flow of output will tend to lower growth. This phenomenon seems to affect the Caribbean disproportionately based on the public discourse on Caribbean governments' investment projects over the last decade. Many studies especially Haque (2004) challenged the Devarajan et. al. (1996) results and shows that if the data is corrected for stationarity, the traditional result that capital expenditure is growth enhancing while government consumption has a negative effect on growth holds. In terms of specific functional areas of government expenditure, the balance of evidence from studies (Bose et al., 2005, Haque and Kim, 2005 and Adam and Bevan, 2005) seems to suggest that expenditure on health, education, transport and communications and infrastructure is productive while wages and transfers are not.

The above analysis highlight the fact that the real challenge for adjustment seems to be on the expenditure side and in this context it is surprising that more studies have not focused on the area of public expenditure efficiency in the Caribbean. A few have looked at how aggregate expenditure affects growth (Grenade and Moore, 2008) but even fewer studies have investigated the issue of the efficiency of different categories of expenditure on growth in the Caribbean. Belgrave and Craigwell (1995) and Craigwell, Bynoe and Lowe (2011) are the only studies that address this issue in the Caribbean. The results of the first study indicated that capital, health, transport and housing expenditures are growth enhancing and therefore appears to be productive whereas current expenditure and education expenditure lowers growth in Barbados. The second study suggests that health expenditures are effective in improving health indicators and therefore seemed to be productive/efficient while education expenditure had no impact on educational achievement in the Caribbean.

Studies on public expenditure efficiency in the Caribbean to date, however, only provide indicative guidelines such as that capital expenditure seems to be more productive. What is needed is a disaggregated evaluation of the efficiency of different expenditure components so that informed decisions can be made as to how to rebalance components without damaging growth prospects. This would allow the authorities for example to make better decisions in terms of which components of expenditure may be cut without unduly hampering growth in the context of a fiscal consolidation programme. This sort of analysis has not been done for the full set of expenditure components in the Caribbean thus far. When trying to measure efficiency one assumes that the higher the expenditure the greater the benefits to the intended recipients but as Tanzi (1974) showed this is not necessarily the case.

This benchmarking of the inputs (expenditure) by the benefits derived (output) is central to the concept of expenditure efficiency. Expenditure efficiency cannot be measured directly so the practice has been to use indices and performance indicators to gauge its level. This approach is useful in that it focuses attention on output, however, it does not allow for the determination of

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<sup>8</sup> In other words, greater efficiency of government expenditure depended not only on the productivity of different expenditure components but also the share of the budget allocated to each component over time.

the maximum efficiency that can be achieved for a given input which is central to efficiency analysis. In this regard, efficiency frontier approaches have filled this gap. The efficient frontier in practice is estimated by either parametric or non-parametric approaches<sup>9</sup>.

#### 4.0 Identifying Inefficient Public Expenditures in the Caribbean

In our attempt to determine the efficiency or productivity of government expenditures in select Caribbean countries we use the non-parametric rather than the parametric approach to avoid the complexity of defining the functional form of the efficiency frontier and of the non-parametric approaches we use Free Disposable Hull (FDH)<sup>10</sup> analysis rather than the Data Envelopment Analysis (DEA) approach because it imposes the fewest restrictions and because of its simplicity and intuitive appeal<sup>11</sup>.

We adopt the methodology used by Alphonso et. al. (2005) based on the development of composite indicators of public sector performance which are considered as outcomes of public sector policies and used these to compute public sector efficiency ratios defined as the public sector performance indicator divided by the relevant category of government expenditure (input). Finally, using FDH analysis the efficiency frontier is developed and this is used the rank the efficiency of each country. The efficient frontier determines which countries are producing the highest level of output for a given level of input (output efficiency) or, conversely, which is using the lowest level of input for a given output level (input efficiency).

In this framework public sector performance (*PSP*) depends on selected economic and social indicators (*I*) in *k* dimensions representative of outcomes in public policy areas such as health, education and economic performance. Public sector performance is therefore represented as:

$$PSP_i = \sum_{j=1}^n PSP_{ij}$$

where  $PSP_{ij} = f(I_k)$  with countries indexed as *i* areas of government performance as *j*. An improvement in PSP is therefore driven by improvements in the social and economic indicators.

$$\Delta PSP_{ij} = \sum_{i=k}^n \frac{\partial f}{\partial I_k} \Delta I_k$$

Public sector performance (PSP) indicators reflect outcomes without considering the costs (public expenditure) of achieving this performance. To get an idea of the efficiency with which these outcomes are achieved public sector efficiency (PSE) ratios are calculated by weighting these PSP indicators by the relevant public expenditure component (PEX) as a percentage of

<sup>9</sup> See Mandl et. Al. (2008) for a discussion of parametric and non-parametric methodologies to efficiency frontier analysis, as well as, the pros and cons of the FDH and DEA non-parametric approaches.

<sup>10</sup> Studies that have adopted this approach include Fakin and Crombrugghe (1997), Clements (2002) for education spending in Europe and Gupta and Verhoeven (2001) for education and health in Africa.

<sup>11</sup> In any case the results from FDH and DEA approaches seem to be broadly comparable (Alphonso and Aubyn (2005).

GDP for each of the seven areas in Table 4. The public expenditure components used are annual averages since it is assumed that expenditure over the previous decade would impact on outcomes in the present. In terms of relevant expenditure components to be used as inputs, we use expenditure on health, education, capital, wages and salaries and goods and services, subsidies and transfers and total expenditure. Expenditures on health and education are good fits as inputs in these areas while capital expenditure is a relatively good fit the input in the area of infrastructure and so too is using subsidies and transfers as input in the area of income distribution. Total expenditure is used as the relevant input in the areas of economic stability and economic performance. We also use the sum of wages and salaries and goods and services as the input for the area of administration but this is a fairly rough approximation<sup>12</sup>.

$$PSE_i = \frac{PSP_i}{PSX_i} = \sum_{j=1}^n \frac{PSP_{ij}}{PEX_{ij}}$$

Following Alphonso et. al. (2005) we use seven social and economic indicators of public sector performance. An efficient public service, a healthy and educated workforce and good infrastructure are key factors in a country's economic efficiency. Additionally, an even distribution of income, economic stability and allocative efficiency are also key government objectives in the context of a well functioning economy. These indicators therefore include public administration, health, education, infrastructure, income distribution, economic stability and economic performance, some of which are in turn comprised of sub-indicators. These seven indicators are used to construct a composite index of public sector performance. The sub-indicators, indicators, their sources and some information on their metadata are detailed in Table 4.

We use data on indicators 1 to 5 for 2010 (or most recent year) and averages for indicators 6 and 7. In cases where increasing values of indicators measure deterioration (inflation, unemployment, standard deviation of GDP growth and the loss in HDI index due to inequality) we use the inverse of the indicator. The latest data available and annual averages are used because we are more interested in structural change in public sector performance rather than annual changes. Additionally, many of the indicators such as life expectancy change very slowly over time and measuring them every 10 years is adequate for our purposes. In cases where indicators change frequently such as GDP growth and inflation, we use averages to capture the structural change. In compiling individual indicators we normalize sub-indicators and set the average for each equal to 1 with the values for the particular indicator for each country being calculated relative to the average. The composite index is calculated as an average of all seven indicators using equal weights. Since this methodology is based on comparisons we include Malaysia as a comparator country since it's a developing country with similar governance challenges but ranks relatively high in public sector performance based on the Global Competitiveness Report ranking<sup>13</sup>.

Table 4: Components of the Composite Public Sector Performance Index

<sup>12</sup> Alphonso et. Al. (2005) noted that all expenditure components used are not equally suitable as benchmarks for measuring efficiency. This also assumes that all expenditure is comparable across countries.

<sup>13</sup> It may be better to include more comparators since we are using a *relative* concept of efficiency and therefore the relevance of the peer group in terms of the efficiency of government is critical.



Indicator	Sub-Indicator	Source	Metadata
1. Administration	Corruption Control	World Bank WDI	As defined in WDI
	Government Effectiveness	World Bank WDI	As defined in WDI
	Regulatory Quality	World Bank WDI	As defined in WDI
2. Health	Infant Mortality Rate	World Bank WDI	As defined in WDI
	Life Expectancy	World Bank WDI	As defined in WDI
3. Education	Primary School Enrollment	World Bank WDI	As defined in WDI
	Secondary School Enrollment	World Bank WDI	As defined in WDI
4. Public Infrastructure	Overall Quality of Public Infrastructure	World Competitiveness Report	Indicator 2.01 Quality of Overall Infrastructure
5. Distribution	Income Distribution	World Bank Human Development Index	Loss in HDI Index Score due to Inequality
6. Economic Stability	Stability of GDP	World Bank WDI	Standard Deviation
	Inflation	World Bank WDI	10 Year Average
7. Economic Performance	GDP Per Capita Growth	World Bank WDI	10 Year Average
	Economic Growth	World Bank WDI	10 Year Average
	Unemployment	World Bank WDI	10 Year Average

The composite public sector performance index and its components are shown in Table 5. The indicators suggest there are significant differences in performance across functional areas and across countries. The Bahamas and Barbados performed well in the areas of administration while Jamaica, Suriname and Trinidad and Tobago did poorly. The performances in the areas of health, education, infrastructure and economic stability were more homogenous across Caribbean countries with the Bahamas and Barbados tending to perform better than their Caribbean counterparts. In terms of income distribution Barbados and the Bahamas performed significantly better than other Caribbean countries. In terms of economic performance Trinidad and Tobago and Suriname performed well with the Bahamas registering the lowest score. In terms of the composite indicator there were notable but not large differences in performance with Trinidad and Tobago registering the highest score.

These public sector performance indicators are useful but they do not take account of the amount of resources deployed to achieve these outcomes. To develop indicators of public sector expenditure efficiency we need to weight these output indicators by the relevant amount of government expenditure (inputs) used to generate these outcomes. To compute these public sector efficiency indicators, public spending in the various functional areas were normalized by computing the average for each functional area and then benchmarking each country relative to the average. These normalised expenditure ratios in each of the functional areas were then used to adjust the public sector performance indicators in the respective areas to compute the efficiency ratios which are outlined in Table 5.

The efficiency ratios suggests that there are significant differences in efficiency between countries and across different functional areas. The efficiency indicator shows that just looking at the output indicators is useful but can be misleading. Based on the efficiency indicator, The

Bahamas now has the highest rank followed by Trinidad and Tobago whereas these countries were ranked third and first respectively when the countries were ranked on the output indicator. Also, Barbados which was ranked second based on the output indicator is now ranked last among Caribbean countries when we use the efficiency ratio which takes account of inputs (relative expenditure). If countries used relatively low expenditure in the various functional areas to achieve the outcomes it raised its efficiency score.

Table 5: Composite Indicators of Public Sector Expenditure Performance

Country	Indicators								
		Adminis- tration	Health	Education	Infra- structure	Distri- bution	Economic Stability	Economic Performance	Total
Bahamas	PSEP	0.9767	0.7300	1.0500	0.6900	0.9200	0.3550	0.6533	0.7679
	GE	13.2000	3.4000	3.5000	2.9000	2.9000	21.0000	21.0000	
	Norm GE	1.0326	1.0303	0.8468	0.7436	0.3867	0.7275	0.7275	
	PSEE	0.9458	0.7085	1.2400	0.9279	2.3793	0.4880	0.8981	1.0840
Barbados	PSEP	1.0976	0.6736	1.1031	0.7466	1.0870	0.2838	0.4907	0.7832
	GE	15.2000	2.9000	6.7000	4.7000	11.2000	35.9000	35.9000	
	Norm GE	1.1890	0.8788	1.6210	1.2051	1.4933	1.2436	1.2436	
	PSEE	0.9231	0.7665	0.6805	0.6195	0.7279	0.2282	0.3946	0.6200
Jamaica	PSEP	0.0282	0.6710	0.9073	0.6232	0.6536	0.2057	1.0213	0.5872
	GE	10.7000	2.6000	4.8000	2.4000	5.9000	33.1000	33.1000	
	Norm GE	0.8370	0.7879	1.1613	0.6154	0.7867	1.1467	1.1467	
	PSEE	0.0337	0.8516	0.7812	1.0128	0.8308	0.1794	0.8907	0.6543
Suriname	PSEP	0.4017	0.5418	0.9410	0.5729	0.6667	0.1588	1.6078	0.5839
	GE	18.9000	2.5000	3.5000	4.1000	5.2000	30.2000	30.2000	
	Norm GE	1.4785	0.7576	0.8468	1.0513	0.6933	1.0462	1.0462	
	PSEE	0.2717	0.7152	1.1113	0.5449	0.9615	0.1518	1.5369	0.6785
Trinidad and Tobago	PSEP	0.1281	0.5504	0.9733	0.6335	0.6024	0.2593	2.9839	0.8758
	GE	9.2000	2.4000	4.2000	3.6000	11.2000	27.1000	27.1000	
	Norm GE	0.7197	0.7273	1.0161	0.9231	1.4933	0.9388	0.9388	
	PSEE	0.1780	0.7568	0.9578	0.6863	0.4034	0.2762	3.1784	0.9196
Malaysia	PSEP	0.6109	1.2322	0.8229	0.7067	1.4925	0.2910	4.2539	1.3443
	GE	9.5000	6.0000	2.1000	5.7000	8.6000	25.9000	25.9000	
	Norm GE	0.7432	1.8182	0.5081	1.4615	1.1467	0.8972	0.8972	
	PSEE	0.8221	0.6777	1.6196	0.4835	1.3016	0.3244	4.7411	1.4243
Car. Ave.	PSEP	0.3658	0.6333	0.9949	0.6532	0.7859	0.2525	1.3514	0.7196
Car. Ave.	PSEE	0.3618	0.7597	0.9542	0.7583	1.0606	0.2647	1.3797	0.8339

Notes: PSEP-public sector expenditure performance, GE-ratio of government expenditure to GDP, Norm GE-normalised government expenditure to GDP ratio, PSEE-public sector expenditure efficiency.

We then use the information from the public sector performance indicators and information on expenditure in various functional areas to measure the efficiency frontier and to determine the relative productivity of government expenditures. We focus here on input efficiency since the focus is on determining expenditure areas that have been wasteful and which can be cut without a corresponding fall in performance. The total input efficiency scores of relevant countries, as well as, the inputs efficiency scores for each country in important expenditure components for analytical purposes are presented in Table 6.

Table 6: Input Efficiency Scores

Country	Expenditure Component					
	Health	Education	Wages and Salaries	Capital Expenditure	Subsidies and Transfers	Total Expenditure
The Bahamas	1.0000	1.0000	1.0000	0.8276	1.0000	1.0000
Suriname	0.9600	1.0000	0.4868	0.5854	0.5577	0.6954
Jamaica	0.9231	0.7292	0.8598	1.0000	0.4915	0.6344
Malaysia	0.5667	1.0000	0.9684	0.8246	1.0000	1.0000
Barbados	0.8276	0.5224	0.8684	1.0000	0.7679	0.7214
Trinidad	1.0000	0.8333	1.0000	0.6667	0.2589	0.9557
Caribbean Average	0.9421	0.8169	0.8430	0.8159	0.6152	0.8013

The average input efficiency score is 0.80 suggesting that the Caribbean countries reviewed can achieve the same level of output/outcomes by using only 80% of the expenditure they are currently using. In the area of transfers and subsidies there is even more room for improvement since the average input efficiency score implies that they can generate the same level of performance with only 61.5% of the expenditure while Jamaica has the lowest input efficiency score of 0.63. In terms of particular countries there is considerable difference in performance with the Bahamas being on the efficiency frontier in all expenditure categories except capital expenditures. Trinidad and Tobago is also on the frontier in health and government consumption expenditure but the worst performer in the area of transfers and subsidies. This implies that expenditure can be cut in many areas in different countries without registering a corresponding fall in performance in terms of the output indicators.

The input efficiency scores can be used to get an estimate of productive expenditure since it reflects the degree to which expenditures can be cut without lowering performance in the thematic areas. This is outlined in Table 7. By definition expenditure items on the efficiency frontier cannot be improved upon but in all areas where the score is less than one there is scope for improvements since a smaller proportion of government expenditures in these areas are efficient/productive.

In terms of total expenditure, the Bahamas seems to have little scope for improvement by adjusting expenditure since it is generally on the frontier and almost all of actual expenditure or about 21% of GDP are effective. In the case of Barbados, Jamaica and Suriname however, the productive expenditures are approximately 10% of GDP lower than actual expenditure so there is significant scope for improvement for cutting unproductive expenditures. Trinidad and Tobago's

scope for improvement is much more moderate at about 1% of GDP. A rough estimate of productive expenditures as a percentage of GDP are 21%, 25.9%, 20.9%, 20.8% and 25.9% for the Bahamas, Barbados, Jamaica, Suriname and Trinidad and Tobago respectively (see Table 7).

When we look at the separate components of expenditure we see that there are significant room for improvement in education expenditure for Barbados and Jamaica, salaries and wages in Suriname and subsidies and transfers in Barbados and Trinidad and Tobago.

Table 7: Actual and Productive Expenditures

Country	Expenditure Areas						
		Health	Education	Wages and Salaries	Capital Expenditure	Subsidies and Transfers	Total Expenditure
Bahamas	PEXP	3.4000	3.5000	13.2000	2.4000	2.9000	21.0000
	AGE	3.4000	3.5000	13.2000	2.9000	2.9000	21.0000
	Input Eff.	1.0000	1.0000	1.0000	0.8276	1.0000	1.0000
Barbados	PEXP	2.4000	3.5000	13.2000	4.7000	8.6000	25.9000
	AGE	2.9000	6.7000	15.2000	4.7000	11.2000	35.9000
	Input Eff.	0.8276	0.5224	0.8684	1.0000	0.7679	0.7214
Jamaica	PEXP	2.4000	3.5000	9.2000	2.4000	2.9000	20.9000
	AGE	2.6000	4.8000	10.7000	2.4000	5.9000	33.1000
	Input Eff.	0.9231	0.7292	0.8598	1.0000	0.4915	0.6344
Suriname	PEXP	2.4000	3.5000	9.2000	2.4000	2.9000	20.8000
	AGE	2.5000	3.5000	18.9000	4.1000	5.2000	30.2000
	Input Eff.	0.9600	1.0000	0.4868	0.5854	0.5577	0.6954
Trinidad	PEXP	2.4000	3.5000	9.2000	2.4000	2.9000	25.9000
	AGE	2.4000	4.2000	9.2000	3.6000	11.2000	27.1000
	Input Eff.	1.0000	0.8333	1.0000	0.6667	0.2589	0.9557

Notes: PEXP- productive expenditure, Age- average government expenditure.

The components do not add up to the total since the components are not mutually exclusive.

## 5.0 Conclusion

The indicative results produced by the analysis suggest that there is significant scope for improvement in the efficiency of government expenditure in the Caribbean. The countries reviewed appear to have scope for improved efficiency in all functional areas but subsidies and transfers seem to be a area in which the biggest improvement needs to be made. Research in this area can form the basis of a system for the proper benchmarking of the performance of government expenditure in the context of public expenditure management programmes. The weakness in the analysis of course stems from the unavailability of a better range of output indicators to capture more comprehensively the outcomes targeted by particular categories of expenditure, as well as the difficulty in aligning expenditure components with their relevant

output variables. This suggests that the data system to support public expenditure management systems needs to be improved in all jurisdictions in the region. In particular, indicators related to poverty and income inequality, as well as infrastructure development need to be produced on a more consistent and regular basis to support this type of analysis.

This type of analysis is critical at this juncture in Caribbean economic development since in the short to medium term the international economic environment is likely to remain difficult and constrain government revenue streams. Additionally, since the improvement in the tax and government revenue system will be a longer term undertaking the reality is that much of the fiscal consolidation that needs to be done is likely to be implemented on the expenditure side. This approach to measuring the efficiency of government expenditure can provide the basis for cutting expenditure in areas where there is scope for efficiency improvements which do not necessarily impair the outcomes targeted by particular categories of expenditure and by extension may not be a major impediment to growth.

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