THE IMPACT OF GOVERNMENT EXPENDITURE ON ECONOMIC GROWTH IN THE OECS: A DISAGGREGATED APPROACH

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Abstract

This paper represents a …rst-run in a larger research agenda to assess how …scal policy in‡uences economic growth. The paper is broadly consistent with the literature but it opens new grounds by focusing on the short to medium term impact of …scal policy and incorporates the distortionary e¤ects of government activities. The thoeretical model provided some insights as to how the channels through which …scal policy a¤ect growth and leaves room for further discussion of some of the stylised facts of tthe growth di¤ernetial between mature and newly emergent economies. Our estimation results were mixed but provided important clues as to how to proceed in exploring this research program.

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1 Introduction

The size of Government and its impact on economic growth has emerged as a major public choice issue facing economies in transition. Previous research focused predominantly on size of Government in industrialised countries. However, given the openness of most LDC's , trade dependency and the vulnerability to external shocks, the role and size of Government become germane to adjustment and stabilisation programmes. The question of the size of Government has traditionally been divided between two extremes. The …rst argues that larger government is typically detrimental to e¢ciency, productivity and growth. The basis being that the public sector is not responsive to market signals; an onerous regulatory process that engenders higher production costs ; and distortions that arise from both …scal and monetary policies. Arguments in favor of larger government articulate the need for provision of certain goods and services that would otherwise not be provided by the private sector, in order to place the economy on a predetermined growth path. The premise of the latter position is predicated on the issue of market failure arising from externalities.

There is a lack of consensus on both the empirical impacts of size of government on growth. In addition, economic theory does not provide a well developed methodology for the incorporation of government expenditures in standard growth models. Studies that have found a negative relationship between the size of government and growth include Landau (1986), Barro (1990), Grier and Tullock (1989). Other that have found a positive relationship are those of Ram (1986), Aschauer (1989) while those of Kormendi and Meguire have found no signi…cant relationship.

Most of the above studies have utilised aggregate measures of government size in the form of either growth in government consumption or government consumption as a ratio to GDP. The purpose of this study is to address the issue of the impact of the composition of government expenditure on growth in the OECS through utilising the framework developed by Devarajan, Swaroop and Zou (1995). The analysis will determine which categories of government expenditure are productive and which categories can be pruned during …scal adjustment. The paper is organised into fours sections. The …rst reviews some of the previous empirical approaches with a view to addressing, measurement, estimation and theoretical issues. The second provides the theoretical underpinnings of the model while the third and fourth address estimation and discussion of results respectively.

1.1 Government Spending and Economic Growth

The provision of social and physical infrastructure through public investment and expenditure on some goods and services theoretically can indirectly im-

prove productivity in the private sector through a more e¢cient allocation of resources. Other bene…ts of government expenditure include the correction of market failure and the preservation of property rights through legislation and the provision of security services. Conversely from an accounting perspective, increases in government consumption is achieved at the expense of capital formation or private consumption. Some developmental economists of the structuralist school posit that some categories of government expenditure are necessary to overcome constraints to economic growth. Chenery and Syrquin(1975).

The …ndings of Landau (1983) that the share of government consumption to GDP reduced economic growth was consistent with the pro-market view that the growth in government constrains overall economic growth. These …ndings were robust to varying sample periods, weighting by population and mix of both developed and developing countries (104 countries). The conclusions were germane to growth in per capita output and do not necessarily speak to increases in economic welfare. Economic growth was also found to be positively related to total investment in education. In a later study, Landau (1986), extends the analysis to include human and physical capital, political, international conditions as well as a three year lag on government spending in GDP. Government spending was disaggregated to include investment, transfers, education, defense and other government consumption. The results in part mirrored the earlier study in that general government consumption was signi…cant and had a negative in‡uence on growth. Education spending was positive but not signi…cant. It was unclear why lagged variables were included given that the channels through which government in‡uence growth suggest a contemporaneous relationship.

Barro (1991) further notes that for a broad group of 98 countries that growth in real per capita GDP was positively related to initial human capital and negatively related to share of government consumption in GDP. The work by Ashauer (1989) focussed on a demand side hypothesis that a high marginal productivity of government spending would yield multiple expansion in output. To the extent that these expenditures are productive, a reduction in expenditures may a¤ect longer term movements in productivity. The income e¤ects arising from government expenditures feed into Wagner's Law that addresses the income elasticity of public goods. Although, his …ndings which employed U.S. data indicate that non-military public capital and in particular 'core' infrastructure were important to productivity they did not support Wagner's hypothesis.

Ram (1986) marked a rigorous attempt to incorporate a theoretical basis for tracing the impacts of government expenditure to growth through the use of production functions speci…ed for both public and private sectors. The data spanned 115 countries su¢cient to derive broad generalisations for

the market economies investigated. The impact of government spending on growth acted through two channels, the externality and the

Cashin (1995) incorporates the impact of distortionary taxes on growth through use of an endogenous growth model encompassing public investment and transfers. The inclusion of taxes was based on the notion that the size of government is limited by the need to …nance such spending through taxes. Distortionary taxes were found to be inimical to growth while public transfers and capital were growth enhancing. The positive impact of transfers on growth represent a new …nding in panel data estimations. The policy implications suggest that those categories of government spending that are complementary inputs to private production functions are growth enhancing.

Most studies that utilise government consumption as a ratio generally …nd a negative correlation with growth while those that utilise the rate of growth in government spending generally …nd positive correlations. The broad range of variable used in the studies suggest no clear theoretical basis for the speci…cations which are in the main very ad hoc. The research agenda therefore needs to depart from the neoclassical models of Solow (1956) an Swan (1956) that linked long run growth to exogenous technical change. The more recent generation of endogenous growth models such as Easterly and Rebelo (1993); Barro (1990); and Barro and Sala—Martin (1992) o¤er a convenient framework for the inclusion of …scal policy. It is for the above reasons that a sensitivity analysis of cross country growth regressions by Levine and Renelt (1992) concluded that few …ndings are robust to alterations in the list of explanatory variables. Consequently the literature becomes both diverse and unwieldy as few studies control for variables analysed by other researchers.

2 The Model

An economy consists of N identical agents maximising constant intertemporal elasticity of substitution utility functions of the form

$$U = \int_0^{\infty} \frac{(c(t)^{\pm_c} l(t)^{\pm_l} g_c(t)^{\pm_{gc}})^{1-\pm} - 1}{1-\pm} e^{-\rho t} dt \tag{1}$$

where $c(t)$, $g_c(t)$, $l(t)$ and ρ are respectively per person consumption, government consumption expenditure, the subjective rate of time preference and leisure. The coefficient of constant intertemporal elasticity of substitution is $\frac{\pm_i}{\pm_i(1-\pm)-1}$ and $\pm_i$ is the respective share of each choice variable. Constant intertemporal elasticity of substitution holds separately for each choice variable but can vary across arguments. It is assumed that U is strictly concave in all its arguments, no restriction is placed on the cross partials of each argument and the standard Inada conditions hold.

Per person final output is produced by representative agents in this economy using a technology of the form

$$y(t) = A(t)l(t)^{\alpha}[g_l(t)/k(t)]^{\beta} \tag{2}$$

where $y(t)$ is output per person, $A(t)$ is a measure of the level of technology, $g_l(t)/k(t)$ is government expenditure on infrastructure relative to the economy's stock of capital, α and β measures the output elasticity of labor and capital respectively. The production functions exhibits diminishing returns in all its arguments and the appropriate homogeneity conditions hold.

The constraint facing the representative agent and the economy is

$$\dot{k}(t) = A(t)l(t)^{\alpha}[g_l(t)/k(t)]^{\beta} - c(t) - g_l(t) - g_c(t) \tag{3}$$

to maximise

The representative agent's problem is to maximize utility subject to the constraint of capital accumulation.

The relevant set of first order condition for this problem is

$$\pm_c c(t)^{\pm_c-1}(c(t)^{\pm_c} l(t)^{\pm_l} g_c(t)^{\pm_{gc}})^{1-\pm} = \lambda \tag{4}$$

$$\pm_l l(t)^{\pm_l-1}(c(t)^{\pm_c} l(t)^{\pm_l} g_c(t)^{\pm_{gc}})^{1-\pm} = \lambda\alpha A(t)l(t)^{\alpha-1}[g_l(t)/k(t)]^{\beta} \tag{5}$$

$$-\dot{\lambda} = \lambda[\rho - A(t)l(t)^{\alpha} g_l(t)^{\beta} k(t)^{-\beta-1}] \tag{6}$$

and the tranversality condition is

$$\lim_{t \to \infty} k(t)\lambda e^{-\rho t} = 0 \tag{7}$$

Expressions for I(t) and c(t) can be derived from equations (1:4) and (1:5). Solving

$$I(t) = \left[\frac{A(t)(g_I(t)/k(t))^{-}(g_c(t)/v(t))^{\frac{\pm_c}{1-\pm_c}}v}{\pm_I}\right]^{\frac{1-\pm_c}{\pm_I+\circledR(\circledR_c-1)}} \tag{8}$$

$$c(t) = \left[\frac{g_c(t)}{v}\right]^{-1}\left[\frac{A(t)(g_I(t)/k(t))^{-}(g_c(t)/v(t))^{\frac{\pm_c}{1-\pm_c}}v}{\pm_I}\right]^{\frac{-\pm_I(1-\pm_c))}{\pm_I+\circledR(\circledR_c-1)}} \tag{9}$$

The short-run e¤ects equations can deduced by di¤erentiating equations(8) and (9) with respect to their arguments and from the conditions imposed on the utility and production functions. These results are secondary to our analysis so they are stated without proof.

$$\frac{@c}{@k};\frac{@I}{@v};\frac{@c}{@k} > 0;\frac{@c}{@v} < 0 \text{ and } \frac{@c}{g_I};\ \frac{@c}{g_c};\ \frac{@I}{@g_I};\ \frac{@I}{g_c} \ ? \ 0$$

are utilised To determine the long-term impact of government spending on capital accumulation and the shadow price of capital, we re-write equations ((1:3) and (1:6) as

$$\dot{k}(t) = A(t)\left[\frac{A(t)(g_I(t)/k(t))^{-}(g_c(t)/v(t))^{\frac{\pm_c}{1-\pm_c}}v}{\pm_I}\right]^{\frac{\circledR(1-\pm_c)}{\pm_I+\circledR(\circledR_c-1)}}\left[\frac{g_I(t)}{k(t)}\right]^{-} -$$
$$\left[\frac{g_c(t)}{v}\right]^{-1}\left[\frac{A(t)(g_I(t)/k(t))^{-}(g_c(t)/v(t))^{\frac{\pm_c}{1-\pm_c}}v}{\pm_I}\right]^{\frac{-\pm_I(1-\pm_c))}{\pm_I+\circledR(\circledR_c-1)}} - a \tag{10}$$

$$\dot{\lambda} = -\lambda A(t)\left[\frac{A(t)(g_I(t)/k(t))^{-}(g_c(t)/v(t))^{\frac{\pm_c}{1-\pm_c}}v}{\pm_I}\right]^{\frac{\circledR(1-\pm_c)}{\pm_I+\circledR(\circledR_c-1)}} g_I(t)^{-}k(t)^{-1} \tag{11}$$

The two di¤erential equations in (1:9) and (1:10) can solved to yield the dynamic property of interest to our analysis. The primary concern of our analysis to determine as far as possible, the impact of government expenditure on the productive capacity of the model economy, to do this we linearise (1:9) and (1:10)

$$\begin{bmatrix}\dot{k}\\ \dot{v}\end{bmatrix} = \begin{bmatrix}\Box_{11} & \Box_{12}\\ \Box_{21} & \Box_{22}\end{bmatrix}\begin{bmatrix}k-k^{*}\\ v-v^{*}\end{bmatrix} \tag{12}$$

with

$$\Box_{11} = \frac{\copyright_1^{-}\dagger_2\left[\frac{g_I(t)}{k(t)^2}\right]^{-\dagger_2}k(t)^2\left(\frac{g_c(t)}{v}\right)^{\mu}}{g_I(t)g_c(t)} - \frac{\copyright_2^{-}A(t)\left[\frac{g_I(t)}{k(t)^2}\right]^{-(1+\dagger_1)}\left(\frac{g_c(t)}{v}\right)^{\mu\dagger_1}}{g_I(t)}$$

$$\Box_{12} = \frac{\copyright_1^{-}\dagger_2\left[\frac{g_I(t)}{k(t)^2}\right]^{-\dagger_2}k(t)^2\left(\frac{g_c(t)}{v}\right)^{\mu}}{g_I(t)g_c(t)} - \frac{\copyright_2^{-}\dagger_2\left[\frac{g_I(t)}{k(t)^2}\right]^{-\dagger_2}k(t)^3(\mu-1)\left(\frac{g_c(t)}{v}\right)^{\mu}}{g_I(t)}$$

$$\ddot{}_{21} = \copyright_1 A(t)(1 \; \bar{} + \bar{} \; 1)g_I(t)^{-}k(t)^{\left[\frac{g_I(t)}{k(t)}\right]^{-} \; 1} k(t)^{-} \; 2^{\left[\frac{g_c(t)}{v}\right]^{\mu} \; 1}$$

$$\ddot{}_{22} = \frac{\pounds_1 A(t)g_I(t)^{-}\left[\frac{g_I(t)}{k(t)}\right]^{-} \; 1 k(t)^{-} \; 1\left(\frac{g_c(t)}{v}\right)^{\mu} \; 1 \; 1}{v^2}$$

2.1 The Analysis

The general form of the solution for the system in equation in equation(12) is given by

$$k(t) = k^{\cdot} + A_1 e^{\cdot \; 1t} + A_2 e^{\cdot \; 2t} \tag{13}$$

$$v(t) = v^{\cdot} \; \frac{v^{\cdot}\ddot{}_{21}}{v^{\cdot}\ddot{}_{22} + \cdot \; 1} A_1 e^{\cdot \; 1t} + \frac{v^{\cdot}\ddot{}_{21}}{v^{\cdot}\ddot{}_{22} + \cdot \; 2} A_1 e^{\cdot \; 2t} \tag{14}$$

where $\cdot \; i=1;2$ are the eigenvalues associated with this system. The determinant of the matrix of coe¢cients, $¢ = \ddot{}_{11}\ddot{}_{22} \; \ddot{}_{12}\ddot{}_{21}$ is negative indicating that the system has saddlepoint stability. $A_{i=1;2}$ are unknown coe¢cients which can be determined by imposing appropriate initial and terminal conditions.

Our primary interest is to determine to determine the impact of government expenditure on capital accumulation and growth. This requires solving the steady state values obtained in equations(13 ¡ 14) and di¤erentiating them with respect to the two categories of government expenditures.. Our results are similar to Turnovsky and Fisher (1995), we therefore modify and present the results[2] without showing the derivation.

$$\frac{dk^{\cdot}}{g_I} = \frac{\ddot{}_{22}(1 \; F_g)}{¢} + \frac{\ddot{}_{12}F_{kg}}{(U_{cc}(U_{ll} + v^{\cdot}F_{kk)} \; U_{cl}^2)¢} + \frac{v^{\cdot}F_{kl}F_{lg}}{(U_{cc}(U_{ll} + v^{\cdot}F_{kk)} \; U_{cl}^2)¢} \tag{15}$$

$$\frac{dv^{\cdot}}{g_I} = \frac{\ddot{}_{22}(1 \; F_g)}{¢} \; \frac{(F_k + v^{\cdot}l_v F_{kl})F_{kg}}{(U_{cc}(U_{ll} + v^{\cdot}F_{kk)} \; U_{cl}^2)¢} \; \frac{F_{kk}(U_{ll}U_{cg} \; U_{cl}U_{lg})}{(U_{cc}(U_{ll} + v^{\cdot}F_{kk)} \; U_{cl}^2)¢} \tag{16}$$

$$\frac{dv^{\cdot}}{g_c} = \frac{\ddot{}_{22}}{¢} + \frac{(y^{\cdot}=l^{\cdot})(U_{cl}U_{cg} \; U_{cc}U_{lg})}{(U_{cc}(U_{ll} + v^{\cdot}F_{kk)} \; U_{cl}^2)¢} + \frac{F_{kk}(U_{ll}U_{cg} \; U_{cl}U_{lg})}{(U_{cc}(U_{ll} + v^{\cdot}F_{kk)} \; U_{cl}^2)¢} \tag{17}$$

$$\frac{dk^{\cdot}}{g_c} = \frac{\ddot{}_{21}}{¢} + \frac{U_c F_l^{\cdot} F_{kl}}{(U_{cc}(U_{ll} + v^{\cdot}F_{kk)} \; U_{cl}^2)¢}\frac{d}{d}\left(\frac{U_c}{U_l}\right) \tag{18}$$

The signs on equations(15) through (18) are undetermined but they provide some guides to the impact of government expenditure. The e¤ects observed can be decomposed into two main channels. The …rst channel operates invariant to the type of government expenditure and is labelled the "resource withdrawal e¤ect" by Turnovsky and Fisher because it captures the fact that any increase in government expenditure represent a withdrawal of resources from some part t of the economy. In equations(15) through (18);

[2] The actual derivation are available from authors upon request

this e¤ect is determined by the …rst term on the right hand side of these equations.

The long run impact of government consumption expenditures falls squarely out of the neoclassical tradition but with a twist. In this case these expenditures raise both the marginal products of capital and labor. This can be explained as follows: because consumption expenditures are not directly productive, increasing their levels leads to a less than proportional change in output which in turn, increases the shadow price of capital and leads to an increase in the supply of labor . The increase in labour supply raises the marginal productivity of capital above the level consistent with long run equilibrium, this sparks capital accumulation which returns to the system to capital output ratio consistent with long-run equilibrium.

The second re‡ects the impact of directly productive government expenditures. Unsurprisingly, this e¤ect works in reverse of the "withdrawal e¤ect" and leads to a reduction in the long run stock of capital. The reasoning behind this that directly productive expenditure augments the capital stock and leads to a reduction in the shadow price of capital. This reduction in the shadow price mutes capital accumulation and accordingly labour supply through changes in the intertemporal allocation of resources (as measured by changes in the curvature of the utility function) and the long run stock of capital. This is a nice result which could have application, in explaining why mature economies (those which have invested heavily in infrastructure eventually) tend to grow at slower rates than newly industrialised economies.

Table 1: Government Expenditure relative to GDP in the OECS

Item	Ant.	Dom.	Gren.	Mon.	STK	SLC	SVG	OECS
Public Services	6.2	9.3	6.7	7.2	6.6	6.1	6.6	6.7
Administration	4.5	5.8	3.8	4.9	4.4	4.1	4.3	4.4
Public Safety	1.7	3.5	3.0	2.3	2.2	2.0	2.4	2.3
Defence	0.3	-	-	0.1	0.0	-	-	0.2
Education	2.7	4.7	4.8	4.3	2.6	4.5	5.2	4.2
Health	2.9	3.8	3.0	3.1	2.2	2.1	3.4	2.8
Social Security	1.0	2.1	2.3	1.7	1.3	1.2	1.8	1.6
Social Security	0.9	1.6	2.3	1.3	1.3	1.0	1.1	1.2
Social Assistance	0.1	0.5	0.0	0.4	0.0	0.2	0.7	0.2
Housing/Community	0.2	0.2	0.6	0.1	0.1	0.2	1.0	0.3
Housing	-	0.1	0.0	-	0.1	-	-	0.1
Community Development	0.1	0.1	0.1	0.1	0.0	-	0.5	0.1
Sanitary Services	0.0	-	0.5	-	0.2	0.2	0.5	0.2
Other Community	0.1	0.4	0.2	0.3	0.2	0.5	0.2	0.3
Economic Services	4.6	4.0	4..9	4.5	2.1	2.9	5.4	3.9
General Administration	0.7	1.1	0.1	1.5	0.2	0.4	1.4	0.7
Agriculture,Forestry	0.7	1.1	1.3	1.5	0.3	0.8	0.8	0.9
Mining, Manufacturing	1.4	0.2	0.3	0.6	0.0	0.4	1.3	0.5
Electricity, gas/ water	0.2	0.3	0.8	0.2	-	0.1	0.3	0.3
Roads	0.9	1.3	1.7	0.2	0.8	0.9	1.1	0.9
Trans. and Comm.	0.6	0.0	-	0.1	0.1	0.1	0.0	0.1
Tourism	0.1	-	0.7	0.3	0.5	0.3	0.4	0.3
Other Economic Services	-	-	-	-	-	–	-	-
Other Purposes	1.6	2.1	2.2	0.4	2.8	0.8	1.1	1.6
Interest/ commissions	1.6	2.1	2.2	0.4	2.8	0.8	1.1	1.6
Other	-	-	-	-	-	-	-	-
Recurrent	19.6	26.5	24.9	21.6	17.9	25.7	24.7	21.5
Tax Revenue	18.2	24.6	21.3	18.7	16.2	23.5	23.8	21.3
Capital Expenditure	3.0	10.3	7.0	11.3	3.1	7.5	7.3	6.4
Net Recurrent (-)	0.8	1.2	0.4	2.0	1.4	6.4	2.7	2.6

3 An Empirical Application

By and large, management of the macroeconomies of OECS countries have been sound. As indicated in Table 1, the OECS economies were generating recurrent budget savings of close to 2.5% of GDP over the period 1989-1994. Current expenditure averaged 21.% of GDP though there was considerable heterogeneity between countries. Capital expenditure and net lending averaged 6.4% of GDP and exhibited the highest variance of all components of central government expenditure. The 43.6 % of the variance of capital expenditure could be explained by shocks a¤ecting the macroeconomic and 40% could be explained by the lumpiness of the Public Sector Investment Programme project pipeline. The variance of health, transport and communication exhibited varying degrees of correlation with the topography and geographical plurality of some of the OECS economies. The administrative component of central government expenditure exhibited some co-movement with topography and geographical plurality but the association was su¢ciently loose to suggest latent non-economic sources of causation. When compared to the member economies of the OECD or the Group of Seven, government's presence relative to GDP is more pronounced in the OECS. The available data were insu¢cient to determine whether this pronounced presence re‡ected anemic private sector performance or government's crowding out of private initiative or any permutation thereof.

To obtain an estimable relationship between government expenditure and growth, we follow Barro (1989) and Taylor Series expand and then linearise equation(13): We then write the resulting equation as

$$k_{it}(g_l; g_c; d) = \alpha_{it} + \bar{\beta}_i \sum_{i=1}^{i} g_{it} + \bar{\beta}_d \sum_{f=1} d_{it} + \varepsilon_{it} \qquad (19)$$

where k_{it} is a measure of capital accumulation, $g_{it}$is a vector of measures of government expenditures irrespective of the expected impact on productivity, $\bar{\beta}$ is a vector of coe¢cients associated with and d_{it} is a vector of variables capturing the distortionary e¤ect of government activity. The inclusion of measures of distortions di¤erentiate this study from the large literature exploring growth and …scal policy, Cashin (1995) approach is similar to the analysis undertaken in this paper but whereas Cashin's focus is on estimating transition to steady and convergence, our analysis emphasises the short run to medium term impact of government expenditure.

Table 2: Regression Results

Variable	Model 1 Coe¢cient (st.error)	Model 2 Coe¢cient (st.error)	Model 3 Coe¢cient (st.error)	Model 4 Coe¢cient (st.error-)
Constant	0.19			
Agriculture	0.1	-0.26	-0.876	-0.549
	0.438	0.685	0.56	0.693
Education	0.07	-0.005	-0.3	1.445
	0.865	0.326	1.04	0.95
Housing	$1.7£10^{i5}$	$-5£10^{i6}$	$-1.88£10^{i5}$	$-1.13£10^{i5}$
		$1.94£10^{i5}$	$1.62£10^{i6}$	$1.94£10^{i5}$
$Education^2$			8.45	
			4.36	
Social Security	-1.4	-1.17	-0.913	-1.422
	0.44	-.486	0.428	0.5
Capital Expenditure	-0.01	0.027	0.012	0.0256
	0.132	0.144	0.139	0.141
Health	0.77	-0.68	5.49	1.022
	1.203	0,49	2.32	1.16
Roads	0.4	0.463	0.216	0.508
	0.274	0.261	0.279	.0256
Law	0.22	0.931	0.7513	1.139
	0.351	0.491	0.381	0.497
Recurrent	-0.07	-0.111	-0.1187	-0.1238
	0.162	0.163	0.163	0.159
Tax /GDP	-0.22	-0.195	-0.146	-0.1569
	0.0698	0..095	0.091	0.096
Health £ Education	-4.4		-22.65	-12.722
	7.971		10.28	7.85
Total	0.04	0.046	0.046	0.0542
	0.0155		0.014	0.015
$(Health)^2$			-12.862	
			9.89	
Fixed E¤ects				
Antigua		0.288144	-0.016137	0.099607
Dominica		0.226414	-0.053004	0.030007
Grenada		0.214981	-0.044635	0.019967
St. Kitts and Nevis		0.221293	-0.061248	0.024864
St. Lucia		0.217676	-0.058204	0.013824
St. Vincent		0.275135	-0.024264	0.094137
R^2; ($\bar{R}^2$)	0.66,0.56	0.74, 0.63	0.77, 0.64	
F, Log-L	6.53, 187.1	10.6, 208.5	8.56, 217.1	

The variables used in our estimates combine time series and cross-sectional data. Our reason for taking this approach is to minimise estimation bias and limit consistency problems which can arise by not controlling for unobservable country-speci…c e¤ects which may be correlated with other explanatory variables. We use two speci…cation in testing the econometric model. Each speci…cation di¤ers in how the constant term, $®_{it}$ is treated.

In the …xed e¤ects or least squares dummy variable approach, the constant term is treated as unknown parameter which di¤ers across countries but not over time. The general idea behind this approach is to capture country e¤ects through by di¤erence in the constant term associated with each country. The other approach estimates are made using a single group mean.

The data used in our estimations are taken from various issues of the Caribbean Development Bank's Central Government Finance Statistics of the Lesser Developing Countries. Data for Antigua, Dominica, St. Kitts and Nevis, St., Lucia and St. Vincent and the Grenadines for the period 1983-1992. The variables used in the analysis are as follows;

Agriculture: This represents government expenditure on agriculture but does not include government ownership of agricultural enterprises.

Education: This is recurrent expenditure on education. As measured here this variable is weak indicator of the quality of education but its impact on growth is expected to be positive given its budget share

Capital: Government's capital expenditures are expected to be positive though the high within and cross-country variability and the likelihood of slight collinearity with some of the other explanatory variables may lead to sign changes. Collinearity may arise because of limited substitutability between capital and recurrent expenditures e.g.g it may di¢cult to expand school capacity without expanding employment of teachers and ancillary sta¤.

Social Security: These expenditures represent outlays on a broad variety of social and welfare programs including pension payment but excluding National Insurance are expected to be uniformly negative due to their distortionary e¤ects on labor market participation.

Roads : Government recurrent expenditure on roads is expected to contribute positively to growth because of tis direct impact on productivity. Expenditure on roads in roads in the OECS tends to be procyclical with maintenance and expansion rising during the upswing in the cycle and declining during recessions.

Law: Expenditures on defence, public safety, and the judicial system are measured in this category. The measure used here is very broad but these expenditures are expected to be growth enhancing.

Health: health expenditure broadly captures investment in human cap-

ital. This variable has been utilised in one form or another in many (see Barro 1995 for a comprehensive review of this literature)of the empirical estimates of …scal policy impact on growth.

To capture the distortionary e¤ects of government presence in the economy, the variables recurrent expenditure to GDP, taxes relative to GDP and total government expenditure are included. Recurrent revenue/GDP captures the relative presence of government in the economy, while taxes/GDP tries to measure the resource displacement involved in governmental activities. These variables are expected to diminish growth in the short term. Total expenditure, while distortionary, in the short term is expected to act as a stimulus to growth.

Growth is the independent variable in all of the regressions. Growth as used here is measured as the growth in per capita income. Growth is calculated as a …ve- year moving average, Devarajan et al (1996) provided detailed justi…cation for using growth in this format.

Our preliminary estimates are presented in Table 2. The results are mixed with some of the coe¢cients taking unexpected signs or being statistically insigni…cant.. All of the regressions were statistically signi…cant and some of the results were quite robust. The condition number for the regressors was large enough to for us to suspect multicollinearity. The results not withstanding represents a good …rst iteration in this research agenda. Model 1 was estimated by ordinary lease squares assuming no country-speci…c intercepts. Housing, social security , taxes and total expenditure were signi…cant at the 10 % and 5% level respectively. All of coe¢cients had the expected sign except capital expenditure and the interactiion term capturing the interplay between the human capital variables education and health expenditures. The regression …t was good with 66% of the movement in the dependent variable being matched by movement in thee regressor and the overall regression was signi…cant at the 1% level. . An LM test con…rmed the presence of …rst order heteroscedasticity..

Model 2 is essentially the same as Model 3 except that Model 3 was estimated using generalised least squares and least dummy variables to control for country speci…c variation and included variables it capture any nonlinearity associated with the human capital variables. In generalised least squares is essentially least squares with the estimates weighted for group variation. All the regressors had the correct signs including capital which along with housing, roads and education were insigni…cant. The nonlinear term for education was highly signi…cant and positive corroborates the endogenous growth literature contention that human capital yields increasing returns to scale and nonlinearity in production. The nonlinear term for health was signi…cant also but was negative implying that health expenditures can be distortionary which is consistent with the outcome postulated by the theo-

retical model presented earlier in this paper. The regression …t was greater than in Model 1 with more than 75% of the movement in growth being matched by movement in the regressing variables. Model 3 was used to test the joint hypothesis that the country-speci…c were insigni…cant. this was rejected at the 5% level

4 Conclusion

This paper represents a …rst-run in a larger research agenda to assess how …scal policy in‡uences economic growth. The paper is broadly consistent with the literature but it opens new grounds by focusing on the short to medium term impact of …scal policy and incorporates the distortionary effects of government activities. The theoretical model provided some insights as to how the channels through which …scal policy a¤ect growth and leaves room for further discussion of some of the stylised facts of the growth differential between mature and newly emergent economies. Our estimation results were mixed but provided important clues as to how to proceed in exploring this research program.

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