



ECCB Staff Research Paper

The Relationship between Government Expenditure and Potential Output in the Caribbean: Does Efficiency Matter?

Kari Grenade

Research Department, Eastern Caribbean Central Bank,
P.O. Box 89 Basseterre, St Kitts

and

Winston Moore¹

Department of Economics, University of the West Indies, Cave Hill
Campus, Bridgetown, BB11000, Barbados

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Abstract

This study investigates the dynamic relationship between cyclically adjusted government expenditure and potential output in selected Caribbean countries, paying particular attention to the role that government efficiency plays in the relationship. Using annual data covering the period 1970 to 2006, the panel estimations show that a long run relationship exists between expenditure and output with the income elasticity of public expenditure close to unity for most of the countries. The average speed of adjustment in expenditure to its long run position is 2.5 years on average, with few differences across countries. The results also

¹ Corresponding author: W. Moore, Department of Economics, University of the West Indies, Cave Hill Campus, Bridgetown, BB11000, Barbados. Tel.: +246-4174279; Fax: +246-4174260; Email: winston.moore@uwichill.edu.bb

indicate that effectiveness of government policies matter as more efficient governments tend to engage in more prudent spending. The findings have important implications for policymakers in the region.

1.0 Introduction

The broad objective of this study is to investigate the relationship between cyclically adjusted public expenditure and potential output in the member countries of CARICOM², paying specific attention to the role that government efficiency plays in this relationship. Specifically, the study addresses three main questions: (1) Is there a long-run relationship between cyclically adjusted public expenditures and potential output? (2) Is the relationship between expenditure and output stable over time and does it differ across CARICOM countries? (3) How does the quality of public management (government efficiency) affect the relationship?

CARICOM countries provide an ideal framework for the examination of the role that government efficiency plays in the relationship between government expenditure and potential output for several reasons. Firstly, governments in the region have traditionally played a significant role in their respective economies. Not only are they the largest employer in most countries, they also play a vital role in the distribution and allocation of the scarce resources. Real government expenditure, as a proportion of gross domestic product (GDP) ranged from 18.1 to 55.7 percent on average, over the period 1991 to 2006. Secondly, given the income structures of these small developing economies, and in some cases, the frequency and magnitudes of government's inefficiencies in the allocation of public resources, it is important to pay attention to the quality dimension of government in the expenditure–output nexus. Thirdly, given the challenge that most

² Antigua and Barbuda; the Bahamas; Barbados; Belize; Dominica; Grenada; Guyana; Jamaica; St. Kitts and Nevis; St. Lucia; St. Vincent and the Grenadines; Suriname, and; Trinidad and Tobago.

of these countries face in terms of fiscal and debt sustainability, greater insights into the dynamic relationship between government efficiency, expenditure and output would augur well for policy-making in the region.

There have been two main bodies of literature that have explored the relationship between government expenditure and economic growth. The first strand of literature relates to Wagner's Law of Expanding State Expenditures, while the second relates to the Keynesian Counter-Cyclical Policy Intervention Theory. Wagner's Law essentially states that government expenditure increases more than proportionally with economic activity as the goods and services provided by the public sector generally have an income elasticity of greater than one. In the Keynesian framework, government spending is regarded as an exogenous force that accelerates economic growth in the short-run. Empirical investigations that have simultaneously tested the two hypotheses (Wagner and Keynesian) have produced conflicting results, (see for example Park, 1996; Ansari et al., 1997; Alleyne, 1999; Iyare and Lorde, 2004). One possible explanation for the conflicting results is the largely ignored role played by government efficiency. Pritchett and Filmer (1997) and Reinikka and Svensson (2001) commented that as a result of central governments' inefficiencies, only a small amount of expenditure actually reaches its target. As a result, higher spending does not necessarily result in better results.

This study augments the existing body of literature on the dynamic relationship between government expenditure and output but adds a novelty, especially to the existing work done on the Caribbean, by explicitly examining how efficiency can change the nature of the relationship between expenditure and output. The rest of this paper

is organised accordingly; section two reviews the relevant literature, while section three presents some stylised facts on government expenditure and GDP. Section four outlines the empirical methodology and describes the data used, while the empirical results are provided in section five. Section six discusses the policy implications of the study and section seven concludes.

2.0 Literature Review

The literature related to this study is twofold. The first strand focuses on the different empirical investigations of Wagner's law and the Keynesian hypothesis, while the second stand is a relatively new, but evolving one, on the efficiency of government and its effect on economic growth.

Empirical test of Wagner's law is extensive. Thorn (1972) in a study of 52 countries, grouped according to their per capita income, over the period 1952 to 1962 found that government expenditure tend to increase with economic development, which is consistent with Wagner's law. Subsequent studies also established support for Wagner's law, Michas (1975) for Canada, Vatter and Walker (1986) for the USA, Nagarajan and Spears (1990) for Mexico, Gyles (1991) for the United Kingdom and Nomura (1995) for Japan. In marked contrast, there have been some studies which find no support for Wagner's law. The results either showed a tendency for government expenditure to decline with economic development or no relation between the two is found; Singh and Sahni (1984) for India, Henrekson (1993) for Sweden and Legrenzi and Milas (2002) for Italy are notable examples.

More recent studies which have sought to analyze the long run and short run relationships between government expenditure and

economic growth, show long term elasticities of close to, or greater than one. Arpaia and Turrini (2007) in their investigation of the dynamic properties of the relationship between government expenditure and economic growth in 15 European Union countries over the period 1970 -2003, found a common long term elasticity between cyclically adjusted primary expenditure and potential output of close to unity. For developing countries, Akitoby et al (2006) found co integration between government expenditure and income with long run elasticities slightly above unity. Kolluri et al (2000) reported that government expenditure is co integrated with income with long run elasticities of government expenditure slightly above unity in their study of G7 countries over the period 1960-1993.

Investigations of the two hypotheses (Wagener and Keynesian) tested simultaneously have produced conflicting results primarily due to methodological dissimilarities including estimating techniques and model specifications. Park (1996) in a study of Korea, found strong support for Wagner's law regardless of the functional form used , while in only two of the six functional forms were the Keynesian's principle supported. Anwar et al (1996) in a similar study, but with a much larger sample of 88 countries found that of the 45 countries which had unidirectional causality from government expenditure to output, only in 13 cases was Wagner's law supported. In another study of just three African countries, Ansari et al (1997) found no support for the Keynesian principle while Wagner's law was supported by the data from only one of the countries. Al- Faris (2002) using data for the Gulf Corporation countries over the period 1970- 1997 found support for Wagner's law but did not find any support for the Keynesian principle. Specifically for the Caribbean, Alleyne (1999) in a study of Jamaica, Guyana, Barbados and Trinidad and Tobago found no support for Wagner's law. Iyare and Lorde (2004) expanded the

data set and included five additional countries and found mixed results.

In terms of the relationship between government efficiency and economic growth, Cooray (2007) in a study of 51 developing and transition countries over the period 1996 to 2003 investigated the role of the government in economic growth by expanding the neo-classical production function to incorporate two dimensions, that of government- size and quality. The study found that the quality of government as measured by governance has a positive and significant impact on economic growth. This result is congruent with earlier findings which showed that growth is enhanced by improving the efficacy of public capital, [Aschauer (2000), Prichitt (1996) and Hulten (1996)].

Chiou-nan and Vaughn (2007) in their study, where government efficiency was proxied by the 2005 corruption perception index, found that for developed countries, the perceived level of corruption is not significantly correlated with economic growth, unlike developing countries where a significant and negative relationship was found, which suggested that as corruption becomes pervasive and difficult to control, it can lead to government inefficiency, which can retard growth. Earlier works of Akai et al. (2005), Mo (2001) and Ehrlich and Lui (1999) also found negative growth effects of corruption.

Butkiewicz and Yanikkaya (2006) studied the role of institutional quality in economic growth and found that countries with democratic institutions benefit from superior growth performance. Especially for developing countries, estimates using instrumental variable techniques suggest that democratic institutions do experience better growth performance. They cautioned however, that the relationship

between growth and democratic institutions is sensitive to the estimation technique used. This caution is quite pertinent since Glaeser et al (2004) pointed out that some of the instrumental variable techniques used in the literature are flawed. According to the authors, evidence from basic OLS regressions suggested that human capital is a more basic source of growth than are the institutions since poor countries can get out of poverty through good policies, often pursued by dictators. They also held that the construction of most indicators of institutional quality used to examine the link between institutions and growth are conceptually unsuitable for that purpose.

Political rights and the rule of law have also been linked to high growth rates, [Barro (1997) and Barro and Sala-i-Martin (1995)]. In the case of political rights, Barro (1997) found that the relationship with economic growth is non-linear. Political rights initially increase growth but tend to inhibit it once a moderate level of democracy has been attained. He warned however that one cannot infer from this evidence that more or less democracy is a critical element for economic growth.

3.0 Stylised Facts

3.1 Real Government Expenditures in the Caribbean: 1970-2006

Table 1 shows that the level of government expenditure has increased substantially throughout the decades in all countries, with the exception of Guyana and Suriname. Average growth rates in expenditures have been positive; they were particularly strong during the period between 1970 and 1980 ranging from 1.9 percent in the Bahamas to 13.6 percent in Trinidad and Tobago. However, during the nineties, growth in expenditures decelerated in most of the countries and even declined in Trinidad and Tobago. During the

period 1991 to 2006 growth in expenditures regained momentum in all countries, with the outturn in Trinidad and Tobago being most pronounced, where average expenditures grew by 11.9 percent in contrast to the decline of 3.4 percent registered in the previous decade. The increase in government expenditure particularly during the 1970s to mid 1980s reflects the expanded role of the public sector as an instrument to speed development, which was in keeping with the nationalist, and in some cases, socialist ideologies prevailing at the time. In recent times, increases in government expenditures have been underpinned in large measure by two factors: rising wage bills since governments are usually the largest employers and high and rising interest costs due to an escalation in public sector debt levels.

3.2 Non-cyclical Expenditures and Potential Output in the Caribbean: 1970-2006

Figure 1 plots the normalised potential output and expenditure series for each country. In general, there tends to be a positive association between the two series. However, there are significant differences in this relationship over time. In Antigua and Barbuda, the Bahamas, Dominica, Grenada, St. Kitts-Nevis, St. Lucia and St. Vincent and the Grenadines, government expenditure and potential output trended upwards throughout most of the period. In Barbados there was a precipitous drop in expenditure during the early 1990s reflecting the significant reduction in expenditures that took place as part of the country's structural adjustment programme. In the case of Guyana, as part of an attempt to pull the economy out of an economic downturn, non-cyclical expenditure outpaced potential output growth during the early 1980s. However, as the country entered a stand-by arrangement during the early 1980s, government expenditure declined significantly during the late 1990s, and was virtually flat from 1990 to 1995. In the case of Suriname, normalised real expenditures exceeded potential output up until 1990, since then

however, while cyclically-adjusted expenditures have trended downwards, and potential output has generally trended upward. Trinidad and Tobago, like Jamaica and to a lesser extent Guyana, has also seen a significant rise in both expenditures and potential output in the latter half of the sample period, after relatively flat expenditures between 1970 and 1995.

To provide a further analysis of the correlation between potential output and cyclically adjusted expenditures in the Caribbean, the percentage changes in the two series are calculated and plotted in Figure 2. The figure suggests, as should be expected, that changes in government expenditure tend to be more volatile than potential output. Nevertheless, there exists a positive correlation between the two variables in most countries under investigation.

4.0 Data and Empirical Methodology

4.1 Data Definition and Sources

The database employed in this paper includes annual observations of government expenditure and real GDP for all the CARICOM countries spanning the period 1970 to 2006. Government expenditure is primarily taken from the International Monetary Fund's (IMF) International Financial Statistics (Online Edition) as well as the database of the Eastern Caribbean Central Bank, May 2008. Government expenditure is cyclically adjusted to abstract from the automatic response of government expenditure to cyclical conditions. Following Bouthevillain et al. (2001), the elasticity of expenditure with respect to the cyclical component of income is derived using the following regression equation:

$$\Delta \ln g e_t = \kappa_i + \pi_i t + \omega_i \Delta \ln y_{it}^c + v_{it} \quad (1)$$

where t is linear time trend and y_t^c is the cyclical component of income. The coefficient ω , which measures the elasticity of government expenditure to income, is then employed to generate the cyclically adjusted government expenditure series using the following equation:

$$ge_t^{ca} = ge_t * \omega * y_t^{gap} \quad (2)$$

where y_t^{gap} is the output gap defined as $y_t^{gap} = \frac{y_t - y_t^*}{y_t^*}$, where y_t^* is potential output. The trend component of income, obtained using the Christiano and Fitzgerald (2003) band pass filter, is used to proxy potential output. The Christiano and Fitzgerald filter uses all the data and therefore does not suffer with the endpoints problem that is common with the Hodrick-Prescott filter. The trend component models output as a stochastic process and does not inherit the non-stationarity of the original series.

Government efficiency is measured using the government effectiveness index derived by Kaufmann et al. (2008). The index attempts to measure the quality, independence and credibility of public services and policies. The index aggregates a number of indicators in five main areas: (1) policies to improve efficiency of public sector; (2) budget management; (3) efficiency of public expenditures; (4) management of public debt, and; (5) quality of public administration (see Kaufmann et al., 2008, for more details).

4.2 Empirical Methodology

The relationship between cyclically adjusted government expenditure and potential output is modelled using the $ARDI(p_i, q_i)$ model proposed by Lee, Pesaran and Shin (1999), which estimates the long-run relationship jointly with the short-term dynamics. In an error correction mechanism (ECM) representation, the relationship is expressed as follows:

$$\Delta g e_{it} = \alpha_i + \theta_i g e_{it-1} + \beta_i y_{it-1} + \sum_{j=1}^{p_i=1} \gamma_{ij} \Delta g e_{it,j} + \sum_{j=0}^{q_i} \delta_{ij} \Delta y_{it,j} + u_{it} \quad (3)$$

where Δ is the first difference operator, $g e_{it}$ is cyclically adjusted government expenditure in country i and time period t , α_i is an unobserved country-specific effect, θ_i is an adjustment coefficient that is negative and less than 1 in absolute value, y_{it} is potential output and u_{it} is the well-behaved error term. The adjustment parameter θ_i shows how much of a shock to the relationship between government expenditure and potential output is eliminated within a year. The long-run relationship between cyclically adjusted government expenditure and potential output is given by β_i / θ_i .

The main advantage of the ECM representation of the model is that standard estimation and inference methods can be employed regardless of the order of integration of the explanatory variables. To obtain valid coefficient estimates however, the error correction coefficient must be negative and significant, the residuals must be uncorrelated and the explanatory variables must be strictly exogenous. To ensure that these assumptions are satisfied, the adjustment parameter is tested for significance using a normal t-test, an AR test is employed to investigate whether the errors are correlated.

Coefficient estimates for Equation (3) are obtained using three different approaches: static fixed effect (SFE), dynamic fixed effect (DFE), and pooled mean group (PMG).³ The static fixed effect (SFE) model abstracts from all dynamic terms (i.e. $\gamma_{ij} = \delta_{ij} = 0$). The dynamic fixed effect (DFE) model imposes equality on all the slope coefficients and errors variances, but allows the regression intercept to vary across countries. Finally, the pooled mean group (PMG) model imposes homogeneity on all the long-run coefficients but allows the short-run coefficients to vary across countries. De Serres and Pelgrin (2003) noted that long-run relationships are more likely to be homogenous given differences in the adjustment process in countries in the short run. Each estimation approach has its advantages and disadvantages. If the assumption of long-run homogeneity is valid, then the DFE estimates are consistent and efficient, while the PMG estimates are consistent but not efficient. In contrast, if the long-run restrictions are not valid, then the DFE coefficient estimates are inconsistent, while the PMG estimates remain consistent. The validity of the long-run restrictions is evaluated using a Hausman test.⁴

Rayp and Sijpe (2007), however, argue that government efficiency can have an impact on the relationship between government expenditure and potential output. In that study, the authors augmented the fiscal policy model of Barro and Sala-i-Martin (2004) by introducing an efficiency parameter that determines the proportion of government revenue that is spent on productive activities. Rayp and Sijpe (2007)

³³ The Hausman tests rejected the null hypothesis of no correlation between the random effects and the explanatory variables and a joint test of the significance of the fixed-effects was significant at the 1 percent level of testing.

⁴ The Hausman test statistic is given by $m = \hat{q}'[\text{var}(\hat{q})]^{-1} \hat{q}$, where \hat{q} is based on difference in the coefficient vector and is asymptotically distributed with K degrees of freedom (the dimension of coefficient vector).

showed that once this adjustment is made, government efficiency played a key role in the relationship between productive expenditure and growth: the positive association between productive expenditure and growth is weakened in countries with relatively inefficient governments.

5.0 Empirical Results

All three models (PMG, DFE and SFE) suggest that the long-run elasticity of public expenditure was not significantly different from 1 on average in the region. In the PMG model, the average value of the error correction coefficient in the region is negative and statistically different from zero (-0.393), suggesting that any shock to the long-run relationship between cyclically adjusted government expenditure and potential output triggers a change in the opposite direction in government spending. The speed of adjustment is about 2.5 years.

Figure 3 shows the individual error correction coefficients and government expenditure elasticities. All the error correction terms are negative and significant, with the exception of Guyana. However, the error correction coefficient in Dominica and Grenada was above 0.5, suggesting a speed of adjustment of less than two years. In contrast, Antigua and Barbuda, Belize, Guyana and St. Kitts-Nevis had relatively slow speeds of adjustment, about 3 years before government spending and potential output return to equilibrium after a shock. The figure also plots the government expenditure elasticities for individual countries. In the case of Antigua and Barbuda, Belize, Guyana and St. Kitts-Nevis the government expenditure elasticity was greater than one, suggesting that government policy was expansionary over the sample period in these

countries. In most of the other countries, the expenditure elasticity was less than one, ranging from 0.6 to 0.8.

The model passed several robustness tests. The test statistic for the Breusch-Godfrey test for autocorrelation was 1.17 with a p-value of 0.279, suggesting that the null hypothesis of no autocorrelation can not be rejected at normal levels of testing. In addition, a Jarque-Bera test for the normality of the residuals had a test value of 0.752 with a p-value of 0.687 suggesting that the null-hypothesis of normality can not be rejected at normal levels of testing. The chi-square test statistic of whether or not the error-correction term could be pooled was 26.280 with a p-value of 0.010 suggesting that the PMG estimator is better able to account for the dynamic relationship between non-cyclical government spending and potential output. The overall model is able to explain 9 to 16 percent of the fluctuations in non-cyclical government expenditure.

An evaluation of the stability of the model over time is also undertaken and the results are provided in Figure 4. The error correction term was fairly stable over time at about 0.6 over the entire sample period. However, the elasticity coefficient does seem to vary significantly over time. During the 1970s the coefficient rose to as high as 1.755 and fell to a low of 0.847 in the 1980s. The coefficients match, to some extent with historical trends in Caribbean. During the 1970s, cyclically adjusted expenditure would have grown faster than potential output as these countries engaged in large capital expenditure projects in the immediate post-independence period. In 1980s, however, as the effects of rising oil prices and the debt overhang many countries in the region entered into structural adjustment programmes that would have restrained public sector as a key policy priority.

It is possible that the relationship between government expenditure and potential output could be affected by the effectiveness of government policy. The sample of countries was split on the basis of the median value for government effectiveness for the Caribbean.⁵ It is expected that countries with more effective governments are likely to have systems in place to restrain excessive expenditure growth and are therefore likely to have small long-run coefficients linking government expenditure to potential output. In contrast, in countries where government policy is less effective, it is likely that the pressures for spending are greater. The results provided in Table 2 are generally in line with these expectations. In the PMG model, the estimate for the long run elasticity of public expenditure with respect to output is 1.112 in countries with less efficient governments, while in countries with more efficient governments the long run estimate is 0.928. In addition, the speed of adjustment is higher in countries with more effective governments, suggesting that more effective governments are better able to bring expenditure under control after the effects of an economic shock has subsided.

6.0 Policy Implications

The key findings of the study have important policy implications for regional governments. Firstly, the overall results of the PMG model show that a long run relationship exists between government expenditure and potential output in CARICOM countries, with long run elasticity not significantly different from one, on average. This suggests that as potential output expands, the expansion in cyclically adjusted government expenditure is more or less proportional. This

⁵ High efficiency: Antigua and Barbuda (0.42), Bahamas (1.15), Barbados (1.21), Dominica (0.77), St. Kitts and Nevis (0.84), St. Lucia (1.00) and St. Vincent and the Grenadines (0.92). Low efficiency: Belize (-0.18), Grenada (0.17), Guyana (-0.15), Jamaica (0.13), Suriname (-0.03) and Trinidad and Tobago (0.23).

has important implications for the design and conduct of fiscal policy. The result could have implications for the budgetary process, in particular, expenditure planning viz a viz the expected growth in national income. Furthermore, for those countries beset with large fiscal and debt overhangs, it is often bandied about that high rates of GDP growth are needed for countries to grow out of their fiscal and debt doldrums. High rates of growth should generate large revenues, which should help countries retrench some of their debt and correct their fiscal imbalances through contractionary fiscal policies. The results suggest that as countries grow, fiscal policies tend to become more expansionary, this could have implications for fiscal and debt sustainability. The finding that less effective government policies result in higher government spending is an important one. The result should prompt public administrators to improve the quality of public management in the region.

7.0 Conclusions

This study has investigated the dynamic relationship between cyclically adjusted government expenditure and potential output for the member countries of CARICOM, paying specific attention to how government efficiency impacts this relationship. The study evinces some key insights which have policy implications for regional governments. Firstly, the results show that a long run relationship exists between government expenditure and potential output, and that the estimated income elasticity of public expenditure is close to one for most of the countries. The long run elasticity exceeded one only in four countries, supporting Wagner's hypothesis. This finding has implications for policy, in particular, expenditure targeting viz a viz growth in national income. Secondly, the study finds that government expenditure reverts to its equilibrium position rather quickly after a shock that disturbs its equilibrium position with output. The estimates

for the speed of adjustment range between two and three years. Thirdly and perhaps most importantly, the results show that efficiency matters. Countries with effective government policies and strong institutions tend to engage in more prudent spending. The results also show that the speed of adjustment in government expenditure was higher in countries with more effective governments.

The paper exploited the panel structure of the database to conduct the analysis. However, if the assumption of homogeneity within the Caribbean does not hold then a time series type analysis might be more appropriate. The authors attempted to account for the possibility of such heterogeneity, however, by allowing the coefficients as well as the error-correction term to vary across countries. The elasticity of cyclically adjusted spending does not seem very stable over time. This might suggest that a regime-switching model could be utilised in future work. In addition, further work could also probe the elasticity estimates for different categories of expenditure.

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Appendix

Table 1: Government Expenditure in the Caribbean

	Real Government Expenditure (\$USm)			Real Government Expenditure (% change)		
	1970-1980	1981-1990	1991-2006	1970-1980	1981-1990	1991-2006
Antigua & Barbuda	39.2	65.4	123.8	4.1	7.1	5.1
The Bahamas	339.7	512.1	650.0	1.9	4.5	2.5
Barbados	400.0	512.1	560.7	3.6	2.6	1.3
Belize	49.1	68.2	132.7	6.6	0.4	10.2
Dominica	29.4	43.1	54.4	7.5	2.4	1.9
Grenada	34.8	43.8	65.7	4.6	4.9	2.3

Guyana	244.1	371.3	335.4	<i>11.3</i>	<i>0.8</i>	<i>3.2</i>
Jamaica	1,129.5	1,241.4	1,507.4	<i>4.1</i>	<i>0.9</i>	<i>2.6</i>
St. Kitts-Nevis	16.4	27.8	60.1	<i>12.9</i>	<i>3.6</i>	<i>6.6</i>
St. Lucia	38.3	58.5	102.0	<i>5.0</i>	<i>7.6</i>	<i>6.7</i>
St. Vincent & Grenadines	27.0	42.1	64.4	<i>3.9</i>	<i>3.6</i>	<i>4.5</i>
Suriname	153.5	222.7	101.8	<i>2.4</i>	<i>2.4</i>	<i>1.9</i>
Trinidad & Tobago	1,899.6	3,466.4	3,272.9	<i>13.6</i>	<i>-3.4</i>	<i>11.9</i>

Table 2: Estimates of Long-Run Elasticity: Cyclically Adjusted
Government Expenditure and Potential Output

Overall			
<i>Dependent Variable =</i> <i>dlog(government expenditure)</i>	<i>Static Effects</i>	<i>Fixed Effects</i>	<i>Dynamic Fixed Effects</i>
			<i>Pooled Mean Group Model</i>
$\log(\text{realgdp}_{t-1})$	1.028 (0.382)**		0.961 (0.197)**
Error correction term	-0.060 (0.022)**		-0.393 (0.102)**
Adjusted R^2	0.091		0.126
s.e. regression	0.161		0.158
Wald Test ($H_0 : \beta = 1$)	0.005 [0.941]		0.039 [0.844]
High Efficiency			
$\log(\text{realgdp}_{t-1})$	0.815 (0.382)**		0.961 (0.197)**
Error correction term	-0.108 (0.029)**		-0.372 (0.063)**
Adjusted R^2	0.141		0.202
s.e. regression	0.121		0.117
Wald Test ($H_0 : \beta = 1$)	0.741 [0.390]		0.005 [0.947]
Low Efficiency			
$\log(\text{realgdp}_{t-1})$	0.903 (0.903)		0.961 (0.197)**
Error correction term	-0.031 (0.032)		-0.171 (0.055)**
Adjusted R^2	0.094		0.103
s.e. regression	0.198		0.194
Wald Test ($H_0 : \beta = 1$)	0.013 [0.909]		0.005 [0.943]

Notes:

1. Standard errors in parenthesis
2. ** indicated significance at the 5% level
3. Error correction term is the average for all countries in the sample
4. High Efficiency Countries: Antigua & Barbuda, Bahamas, Barbados, Dominica, St Kitts and Nevis, St Lucia and St Vincent and the Grenadines
5. Low Efficiency Countries: Belize, Grenada, Jamaica, Suriname and Trinidad and Tobago.

Figure 1: Cyclically Adjusted Government Expenditure and Potential Output

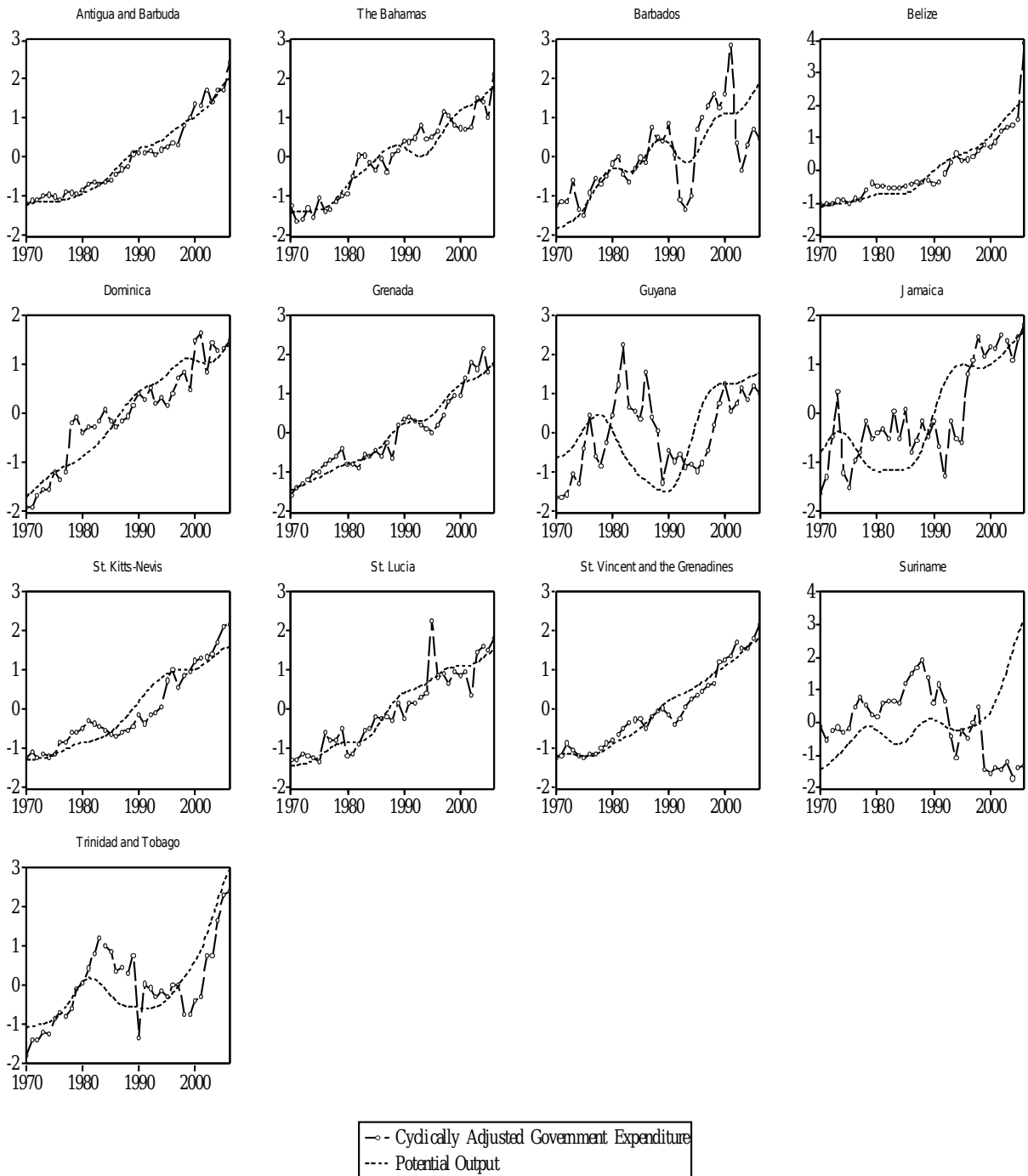


Figure 2: Changes in Cyclically Adjusted Government Expenditure and Changes in Potential Output

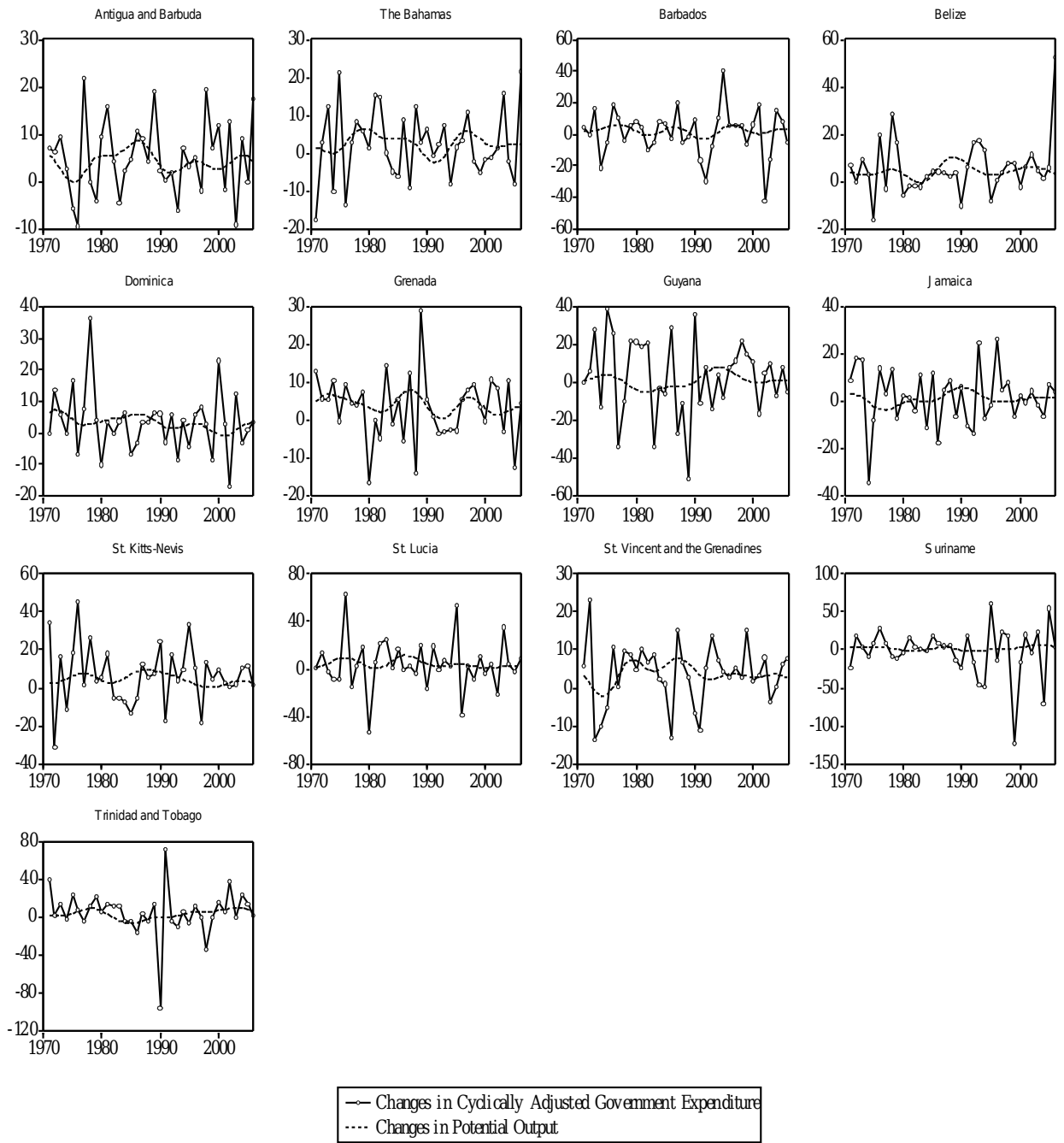
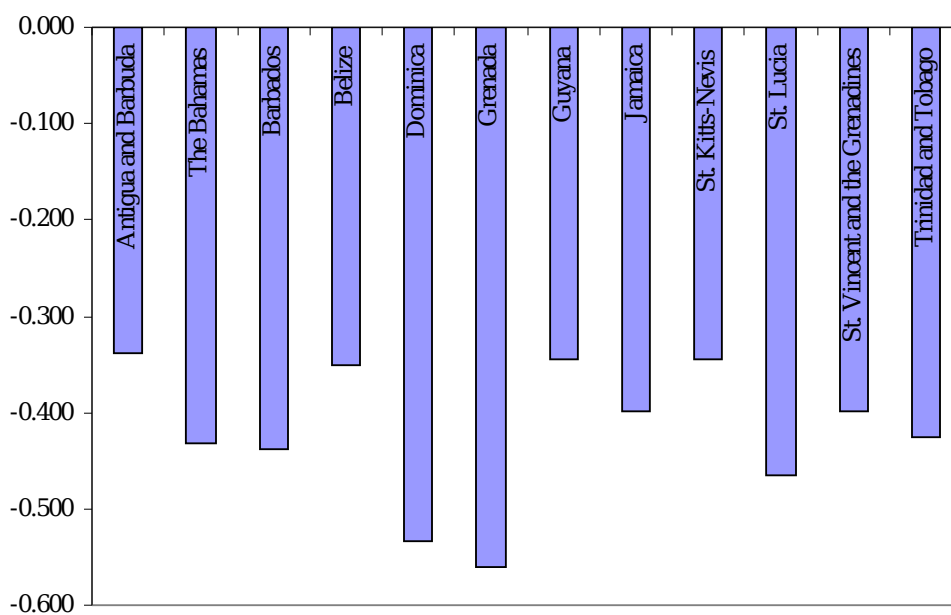


Figure 3: Cross-Sectional Stability of the Pooled Mean Group Model

Error-Correction Term



Elasticity

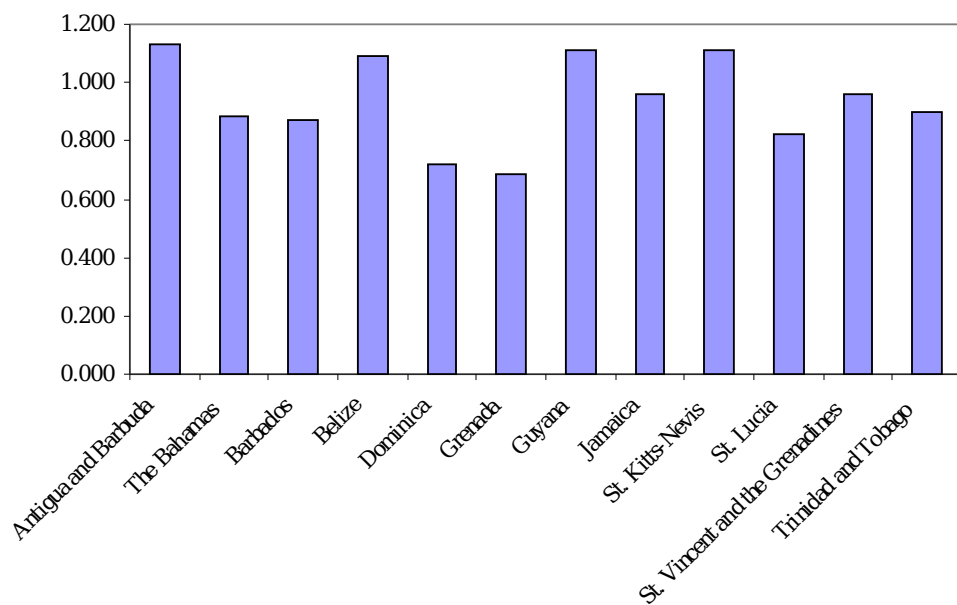
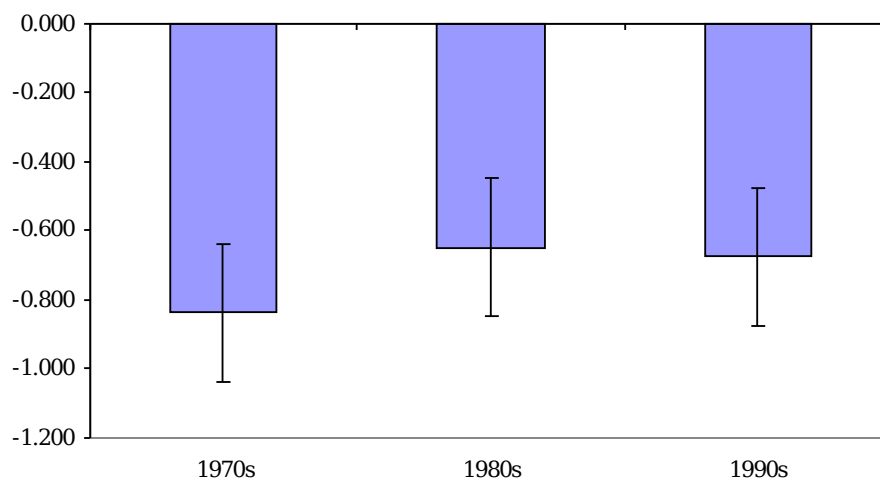


Figure 4: Stability of the Pooled Mean Group Model over Time

Error-Correction Term



Elasticity

