Procyclical Government Spending in the Eastern Caribbean Currency Union States: The Role of Economic Volatility

ANKIE SCOTT-JOSEPH

ABSTRACT

Using simultaneous equation techniques, this paper investigates the effect of economic shocks on the cyclical behaviour of fiscal policy of six Eastern Caribbean States (Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines). This paper contends that fiscal policy failure in these States is associated with their vulnerability to economic shocks such as: increases in international commodity prices and the removal of preferential access to trade markets which can cut exports (and export-related budget revenue) or increase import cost, and cut export-related external financing. With the use of instrument variable method, namely the fixed effect two-stage least square (FE2SLS) method, the empirical analysis suggest that fiscal policy in the underlining States have been procyclial during the period 1990-2008. Notably, the empirical evidence indicates that there is a negative or downward bias in the cyclicality if the economic shock variable is omitted in the estimated model. This observation provides support that higher levels of economic shocks will affect the financial stability of the ECCU States.

Key words: Fiscal policy, Simultaneous equation, Fixed effect two-stage least squares (FE2SLS), economic shocks, ECCU, Fiscal sustainability

1 Introduction

Fiscal sustainability is achieved when countries are able to raise enough revenues to cover their fiscal expenditures and, at least, obtain enough financing to cover the interest costs of their public debt. However, government's ability to raise revenue is affected, among other factors, by economic shocks. Some of the most devastating economic shocks are caused by the rapid decline in the price of a country's major export, changes in interest rates on international capital markets or reduced access to credit (United Nations, 1999). The Latin American crisis of the 1980s, the East Asian crisis of the 1990s and the global economic crisis of 2008 are perfect examples.

The 1980s and 1990s currency crises led some Latin American and East Asian countries to default on their loans because foreign debt became more expensive to pay off. This was because the loans carried floating interest rates that increased along with global rates. The global economic downturn of 2008 was brought about by increased defaults on subprime mortgages in the United States in 2007. This crisis spread from the financial sector to the real economy during the course of 2008. As a consequence, developing countries were faced with substantial deterioration in their growth prospects accompanied by the worsening of a number of key economic and social indicators. Altogether, these events have impacted negatively on the balance of payments – notably exports (commodity price changes) and the budget, particularly budget revenue (import duty shortfalls, devaluation). In some instances, these problems were compounded by massive capital flight - outward transfers of money and currency crises. Common features of these crises were declines in exports, high global interest rates and depleted foreign exchange reserves.

Crises in the global economy create economic shocks in ECCU countries, in part, because recessions in the crisis countries can lead to a low inflow of capital and a sharp fall-off in demand for exports. It is worth noting that external shocks can lead to different responses in each economy. From this perspective, domestic fundamentals act as multipliers of external shocks. This argument is stressed by Calvo et. al., (2003). Indeed, they indicated that domestic factors could be powerful multipliers of external shocks. They further noted that countries faced with similar external shocks can respond differently and that some of these economies may enter into deep crisis, while others may escape unharmed. In this context, it is essential for policy-makers to be aware that economic shocks can have significant negative effects on fiscal sustainability. Therefore, fiscal sustainability should not be viewed simply as the capacity to continue servicing debt obligations without taking into account the fact that higher debt servicing costs necessitate more foreign revenue. In view of these ramifications, the Currency Union countries face growing pressures on how to raise foreign revenue from the agriculture and tourism sectors given that these sectors are susceptible to economic shocks.

The experiences of a number of ECCU States over the years have indicated that economic shocks to the two main export crops - sugar and banana - have led to severe deterioration in foreign earnings/revenue. ECCU States' exposure and vulnerability to exogenous shocks is a key to the understanding of why export revenues have been declining. It may also partially explain the fiscal stance of the Currency Union. For this reason this study investigates whether or not economic vulnerability is an important determinant of fiscal sustainability. The intuition is that a high degree of economic shocks may make it difficult for policy-makers to implement policies and as a consequence the fiscal account will suffer.

Cyclical models are quite useful for examining this assertion. In fact, there is substantial literature on fiscal policy cyclicality; see, for example, Fatàs and Mihow (2006), Fatàs and Mihow (2003), Kaminsky, Reinhart and Vegh (2004), Balassone and Francese (2004), Sørensen, Wu, and Yosha (2001), Arreaza, Sørensen, and Yosha (1999), Lane (1998), and Gavin and Perotti (1997). A shortcoming of this literature is that the focus of much of the work is mainly on the relationship between fiscal aggregates and economic growth to characterize the cyclicality of fiscal policy. Indeed, it is not only critical to consider in the investigation the relationship between variables in the fiscal accounts, and the national accounts but also those in the balance of payments accounts. This is proposed, since economic shocks resulting from an economy's dependence on strategic exports and weakened trade agreement can significantly impact on their fiscal sustainability position. In essence, growths in terms of trade and nonfactor services play an important role in explaining the cyclical properties of fiscal policies in the ECCU. This intuition is formalized and empirically tested by using a Fixed Effects Two-Stage Least Squares regression. The empirical findings suggest the following: (a) fiscal policy is pro-cyclical in the ECCU States with or without the addition of economic shocks; (b) the addition of a variable to account for economic shocks increases the impact value of the pro-cyclical variable; (c) economic shocks negatively impact on output. These findings constitute the main contributions of this study.

The study is divided into 4 sections. Section 1 provides the introduction. Section 2 dwells on the rationale for focusing on the economic vulnerability of the ECCU States and also discusses the main components of the concept - economic vulnerability. The discussion focuses on various types of economic shocks - economic openness, dependence on a narrow range of

exports, dependence on strategic exports and peripherality. Section 3 deals with the evidence of the link between economic vulnerability and unsustainable fiscal policy. It also includes the empirical analysis of cyclicality. Section 4 contains concluding remarks.

2   Why Should we Target Economic Vulnerability?

On the revenue side, the basic sources of the ECCU's governments' revenues are taxes, both indirect and direct. The average tax revenues generated across all ECCU States during the period 1990-2008 accounted for 88.0 per cent of current revenue. Tax collection across countries of the Currency Union was the largest in 2007 (90.3 per cent of current revenue). A key characteristic of the tax system of all member states is that they rely heavily on indirect taxes and particularly taxes on international trade and transactions.

On the expenditure side, wage bills, personal emoluments, consumption of goods and services and interest payments are the main category of expenditure that represents the greater share of government spending. The overall fiscal operation as is evident in the marked decline in the ECCU consolidated fiscal operation during the period 1990-2008. High levels of fiscal imbalances constrain governments' financial capabilities and in some instances cause a delay in the implementation of fiscal adjustment measures. Periodically, fiscal adjustments have tended to affect the expenditure side of the budget more than the revenue side (Chu and Hemming, 1991). Specifically, the level and composition of public expenditure can have conflicting implications for growth, inflation and the balance of payments.

Economic vulnerability should be targeted because ECCU States have poorly diversified economies and are excessively reliant on the exports of few commodities and tourism to

generate foreign revenue. In some instances, economic shocks such as: international commodity prices (to commodity exports or imports), or access to trade markets, can cut exports (and export-related budget revenue) or increase import cost, and cut export-related external financing. Additionally, shocks to the international interest or exchange rates can increase debt burdens and destabilize foreign private capital flows, or cut investment returns on reserves. In other words economic shocks can cause foreign revenue earnings to decline and governments may find it difficult to meet their debt servicing obligations. This inability of the debtor country to service debt can lead to a currency banking or debt crisis which can then have negative implications on fiscal sustainability. Models on currency crisis such as those presented by Krugman (1979), Calvo and Mendoza (1995), Dooley (1997), Corsetti, Pesenti, and Roubini (1999a), and Corsetti and Mackowiak (2001) argue that stress vulnerability to currency crisis stems from balance of payment problems.

The ECCU States are small both in terms of landmark, population size and market structure. The populations range from 41,000 in St. Kitts and Nevis to 140,000 in St. Lucia (the only non-independent states, Anguilla and Montserrat, are much smaller).[i] These States rely heavily on imports to satisfy demand for consumer and producer goods. Production in all eight economies is focused on a very narrow range of goods and services. Over the last three decades, the ECCU countries have been recording consistent and significant trade deficits. In addition, over the last twenty-eight years these States have undergone significant structural changes. This is evident in the marked decline in agriculture's contribution to GDP, which traditionally was the largest contributor to GDP. Currently, the agriculture sector and the tourism industry are the most important contributors to region's economic growth. As a

consequence, the ECCU States have placed great emphasis on implementing policies to foster the development and growth of agriculture and tourism.

In the context of the ECCU States, import levels are higher than export levels and the payment of imports and foreign debt requires foreign currency. Therefore, since shocks to imports and exports are reflected in the balance of payments (BOP), then BOP shocks may lead to devaluation of the nominal exchange rate. This can trigger inflation, higher external debt service and reduce foreign exchange reserves. Moreover, economic shocks to the BOP also have an indirect impact on other sectors, especially the fiscal sector. The main shocks are lower budget revenues due to cuts in export (including tourism) or import taxes and related VAT; higher expenditures to combat the impact of shocks (especially natural disasters); and, lower (especially capital) expenditures if the shocks are not offset by additional financing, or if aid shortfalls lead to cuts in spending.

The primary sources of foreign exchange within the Currency Union emanates from tourism, remittances, offshore financial services, concessionary finance and agriculture. In some ECCU States, the agriculture industry is their main foreign exchange earner and the industry is defined by few commodities. The dependence on limited export-driven cash crops means that the ECCU States are vulnerable to slight changes in terms of trade and commercial agreements. The limited size of the economies does not allow economies of scale and competitiveness in the world market. The ECCU states are therefore economically vulnerable. Although economic vulnerability poses serious constraints, many of these States have managed to attain relatively high GDP per capita, possibly because they have taken steps to build up resilience in order to cope with and withstand their inherent vulnerability.

It is worth recalling that the ECCU countries are more economically vulnerable than other group of countries (Briguglio, 1992, 1995, 1997, 2003; Commonwealth Secretariat, 1997, 1985, 2000 and Crowards 2000). The economic vulnerability of these States is compounded by their high degree of "**economic openness"** rendering them particularly susceptible to economic conditions in the rest of the world: "**dependence on a narrow range of exports"**, giving rise to risks associated with lack of diversification; "**dependence on strategic imports"**, in particular energy and industrial supplies, exacerbated by limited import substitution possibilities; and, "**peripherality",** insularity and remoteness, leading to high transport costs and marginalization (Briguglio, 1992, 1995, 1997, 2003; Briguglio and Galea, 2003; Farrugia, 2004).

2.1   Economic Openness

Economic openness is the extent to which countries are susceptible to external economic conditions over which they have no direct control. It may be argued that, on one hand, openness to international trade could be a source of strength in that it may indicate that a country is participating successfully in the international markets and this may offer opportunities for the economic progress of ECCU States. On the other hand, these countries' participation in international trade could potentially lead to negative outcomes since they are exposed to greater degrees of shocks. Most studies on the impact of terms of trade focuses on the relationship between growth and terms of trade shocks. Among these are works by Easterly and Rebelo (1993) and Mendoza (1997). Easterly and Rebelo (1993) analyzed long-run growth differentials in a large panel of countries and found that terms of trade shocks play a large role in explaining variance in growth across countries. Mendoza (1997), using a sample of

40 developed and developing countries, found that higher terms-of-trade volatility has a negative impact on economic growth. He argued that the channel through which terms of trade volatility affects growth is changes in savings. In general, long-run and short-run economic growth studies have identified exchange rate policy and the institutional environment as determinants of the impact of terms of trade shocks on income growth.

In the past, the ECCU States received trade preferences which were extended by the major industrial countries (principally under the EU Lomé Convention, US Caribbean Basin Initiative, and Canadian CARIBCAN programme). These trade preferences contributed to greater reliance on traditional exports. However, they have also contributed to the ECCU States' vulnerabilities which resulted from the erosion of their trade preferences by multilateral trade liberalization under the GATT/WTO, and unilateral trade liberalization in emerging market countries worldwide. For instance, during 2003, in the agricultural sector sugar and bananas, the main export crops, experienced difficulties as a result of the withdrawal of preferences or weakened trade agreements. The evolution of trade agreements in the banana and the sugar industries highlights the effects of weakened trade agreements that result from their economic openness.

(i)   Weakened Trade Arrangements

The banana industry in the Windward Islands developed in the early 1950s following the collapse of the sugar industry. Since many European countries had colonial empires in Africa, the Caribbean, or Pacific regions most European bananas were imported from former colonies under a complex system of quotas and licenses. As a result, banana production subsequently increased over the years. This performance was attributed to the benefits these countries

enjoyed at the time. Among others benefits were: preferences and high prices in the United Kingdom (UK) market from the 1980s to the mid-1990s; national government support in terms of tax concessions; support to farmers' organizations; and, land distribution schemes. The driving force for the survival of the banana industry has been the preferential access arrangements by the UK Government. This agreement was maintained until July 1993, when the Common Market Organization (CMO) for bananas was established in the European Community. Under this agreement, ACP countries were granted special prices and privileges to agricultural imports, giving them preferential access to the EU market. These privileges began to erode in 1992 and are currently under threat of complete extinction. Preferential arrangement for ACP countries was extended under a new import regime that encompassed the entire Community.

In 1996, Ecuador, Honduras, Guatemala, Mexico and the U.S. requested a dispute settlement panel at the WTO. In May 1997, the panel ruled that many provisions of the EU banana policy were inconsistent with a dozen WTO rules about nondiscrimination. In September 1997, the WTO Appellate Body confirmed this ruling. The European Union's special trading relationships with the developing world under the *Lomé Convention ended* in February 2000 after a United States request to the World Trade Organization. A complaint was launched by the US to the court of the WTO on behalf of its banana producing transnationals, who wanted greater access to the world's largest market, the EU. The WTO ruled the EU's import regime was discriminating unfairly. The EU then decided to allow bananas into the EU on a first come first served basis until the year 2006 when a new tariff regime was implemented.

The removal of preferential access to the European market has lead to a significant increase in prices and decline in export revenue. Windward Island producers are unable to compete with the most important world producers based in Latin America. Latin American producers operate on big plantations and have low production costs due to FDI and intensive production patterns. Dominica, St Vincent and the Grenadines and St Lucia have lost the preferential access for bananas on the EU market. This has caused unemployment and poverty to increase and revenues to decline. On the other hand, St. Kitts and Nevis lost preferential treatment on the EU market for its sugar. This led to declines in trade, remittances, tourism performance and export revenue. Moreover, this poses severe strain on the countries' economies and could contribute to rising poverty and unemployment, especially in rural areas. Nonetheless, terms of trade shocks tend to be minimal in small economies with a flexible exchange rate because relative prices tend to adjust more rapidly through the nominal exchange rate. However, in countries with a fixed exchange rate the adjustment of relative prices may be slower, depending on the stickiness of domestic prices. Therefore countries subject to negative terms of trade shocks recover more rapidly if their exchange rate is flexible (Funke et. al., 2008).

The experiences of ECCU States show that weakened trade arrangements have influenced revenues from international trade. In 2003, receipts from the Currency Union's consolidated merchandise exports fell by 3.2 per cent to EC$701.2m, largely reflecting a decrease in the exports of traditional commodities. During that year, earnings from the export of bananas contracted by 27.5 per cent to represent EC$85.4m. Also, all the banana exporting countries reported declines in receipts ranging from 6.3 per cent in Grenada to 34.8 per cent in

Dominica. Export receipts from sugar contracted by 10.7 per cent to EC$23.1m, reflecting the

fall in production and volume exported. Additionally, in 2003, Dominica's receipts from banana

exports fell by 34.8 per cent to EC$12.8m, partly due to reduced acreage under cultivation. In

Grenada, output of the main crop, nutmeg, fell by 22.5 per cent to 2,433 tonnes and the

production of cocoa contracted by 29.6 per cent to 617 tonnes. This weak performance was

partly attributable to declines in the advanced prices offered to farmers, following a fall in

export demand. As a consequence banana production decreased by 22.5 per cent to 392

tonnes. Grenada's banana industry faced a number of challenges including a lack of reliable

input supply and inadequate capital investment. As it concerns St. Kitts and Nevis, export

earnings fell by 2.8 per cent to EC$161.5m (16.4 per cent of GDP) in 2003, associated primarily

with a 10.7 per cent decrease in receipts from sugar.

2.2   Dependence on a Narrow Range of Exports

With limited natural resource endowments the ECCU States rely heavily on a few

economic sectors – agriculture and tourism. Export earnings from these sectors have been

unstable because these States' exports tend to be highly concentrated on a narrow range of

products and markets. Specifically, they tend to rely on primary products and agricultural

commodities whose prices and demand are subject to fluctuations in world markets. For

instance, the Eastern Caribbean States are uniquely dependent on bananas for their economic

survival. Bananas are the fifth-largest agricultural commodity in world trade.[ii] It is a very

important staple food for the world's poorest people, and the main source of foreign exchange

earnings for the Windward Islands. In Latin America, most bananas are grown on the large-

scale, monoculture plantations; whereas in the Windward Islands the crop is mainly grown on small family owned farms. Remarkably, five large banana companies control more than 80.0 per cent of the world's trade in bananas: Dole (US based): 25.0 per cent, Chiquita (US based): 25.0 per cent, Del Monte (US based): 16 per cent, Noboa (Ecuador): 11.0 per cent and Fyffes (Ireland): 8.0 per cent. The other twenty per cent is controlled by African, Caribbean and Pacific industries.

Bananas provide over half of all export earnings in Dominica, Saint Lucia, and Saint Vincent and the Grenadines. The banana industry has dominated the agricultural landscape of these islands. It is estimated that banana production occupies 27.0 per cent of all agricultural land in the Windward Islands. St. Lucia's 2000 Agricultural census report states that of the total land used for agricultural purposes, 45.0 per cent was taken up by banana cultivation and 42.0 per cent by coconut. This compares with 21.0 per cent in Grenada, 23.0 per cent in St. Vincent and the Grenadines and 16.0 per cent in the relatively more mountainous Dominica. Bananas also contribute about 16.0 per cent of the GDP in Saint Lucia and 17 per cent in Saint Vincent and the Grenadines and Dominica.

In addition to bananas, sugar has been the driving force behind the foreign revenue earnings of ECCU States. In particular, St. Kitts Nevis' economy was driven by earnings from the export of sugar production. With severe fall in revenue earnings the industry was shut-down in July of 2005. The sugar industry was affected severely by the end of European sugar subsidies to African, Caribbean and Pacific States, coupled with the inefficiency of state-run sugar companies, natural disasters such as hurricanes and storms, and vast destruction from monkeys. In 2005, the government of St. Kitts and Nevis abandoned its sugar industry after

years of subsidizing it due to low world market prices, high production costs and the European Union's restructuring of sugar import quotas. The government received the first installment of EC$9.0m from the European Union (EU) to support closure of the 350-year-old sugar industry (reported Caribbean Net News Feb. 23, 2007). Exports have shrunk markedly since the sugar industry died. Public debt was over 180 per cent of the GDP by 2006, making St Kitts and Nevis the second most indebted country in the world.

The sugar and banana industries suffered from similar problems which resulted in higher prices of production, lack of increased production and productivity, absence of economies of scale, labour problems and high cost, slow pace of crop diversification, low levels of technology, inadequate research and development support, removal of farming subsidies and liberalization of the import regime. In actual fact, export price fluctuations within the sugar and banana industries constitute a great source of volatility. The price movement adversely affected ECCU States' balance of payments mainly because of their degree of openness and export concentration in terms of a small number of commodities: banana, sugar and spices. In the case of the Eastern Caribbean economies, export of services like tourism constitutes one of the main sources of income. In comparison with other countries, the ECCU's trade volatility has been high (this is because ECCU States have a high degree of openness and the fact that their export to GDP ratios have consistently exceeded 50.0 per cent).

Reliance on a narrow range of export commodities increases countries' vulnerability to cyclical fluctuations, market prices and weather conditions. To a large extent, this volatility reflects the fact that the small size of the ECCU States restricts their ability to diversify exports, thus giving rise to export concentration. Briguglio (1997) argued that export concentration can

also be observed in the trade in services, especially in tourism and financial services, and he

devised a concentration index with services and exports included. A sharp decline in the world

price of the main export commodity can have a devastating impact on these economies.

2.3   Dependence on Strategic Imports

Another mode of ECCU's economic vulnerability is their dependence on strategic

imports. Such dependence exposes these economies to shocks related to availability and cost

of imported products. The magnitude of the impact depends on import substitution. The small

size of these economies often implies that these countries have relatively high import content

in relation to GDP (Briguglio, 1993) and limitations on import substitution possibilities. Import

substitution policies adopted within these States tend to result in inferior quality products and

higher prices.

Dependence on strategic imports measures the extent to which a country's livelihood

depends on imports. Data for the year 2007 highlight the extent to which the ECCU States are

dependent on imports as imports increased significantly during that year.   In 2007, the

Currency Union's consolidated overall balance of payments surplus fell largely as a result of a

widening of the current account deficit to EC$4,264.3m (36.1 per cent of GDP) from

EC$3,365.2m (30.7 per cent of GDP) in 2006. This reflected increases in the payments for

imports by 14.4 per cent to an estimated EC$6,731.0m (f.o.b). This was associated with

increased economic activity and higher commodity prices, particularly fuel. During 2007, the

current account deficit was particularly high in St. Kitts and Nevis (25.8 per cent of GDP). This

was influenced primarily by a widening of the merchandise trade deficit and a decrease in net

inflows on the services account. The value of imports rose by 9.5 per cent, largely reflecting increases in import payments for food, fuel, and transport equipment partly as a result of the expansion of the economy and higher international prices.

2.4   Peripherality

Peripherality is associated with insularity and remoteness. Insularity and remoteness give rise to similar problems associated with transport and communication, that is, high cost may result from physical distance. Physical distance to the major centers of trade presents a challenge for ECCU States. The distance implies that the transport costs associated with international trade of these States would tend to be high. This is mainly because these islands are separated by sea and therefore use air and sea transportation for their imports and exports. These factors also give rise to uncertainties of supplies given that remoteness of the islands may give rise to problems such as availability of goods due to delays and unreliability of transport services.   In St. Vincent and the Grenadines transportation cost is high and very little trade occurs intra-regionally because of the costs associated with it. Currently, it is cheaper to ship goods to Miami than to Trinidad and some other islands of the Caribbean. This is due to the absence of a regular transport system linking these islands. To a large extent, remoteness and insularity are associated with vulnerability because, among other things, they introduce uncertainties, delays and cost indivisibilities in foreign trade.

3   Linking Economic Vulnerability to Unsustainable Fiscal Policy

In response to economic shocks, fiscal policy should be countercyclical, that is, in order to smooth out fluctuations in income, budget balances should increase in booms and decrease in recessions. During recessions, governments can cut taxes, increase spending, and increase the money supply to catalyze recovery. During rapid expansion, governments can increase taxes, cut spending, and reduce the money supply to reduce inflation. In general, these counter-cyclical policies minimize the deviations from long-run and sort-run output levels. The neoclassical theory of fiscal policy (Barro, 1979) conveys tax smoothing as a way to accommodate transitory shocks to activity, as long as the intertemporal budget constraint is fulfilled. In those circumstances, public debt fluctuations act as a buffer for shocks and they can enable fiscal policy to play its countercyclical role.

There is evidence, however, that in many cases fiscal policy behaves in a pro-cyclical manner, that is, an increase in government spending accompanied by a decrease in tax revenue.[iii] The implication of pro-cyclical policies is that they override automatic stabilizers and have the potential to contribute to economic instability. If economic shocks result in a pro-cyclical fiscal stance, they are likely to amplify economic fluctuations by increasing the volatility of government revenues and unsustainable fiscal policy (Eichengreen and Hausmann, 2004), decreasing long-term economic growth, discouraging new investment (Bernanke, 1983), or by undermining human capital through unemployment (Martin and Rogers, 1997). Additionally, pro-cyclical policy adoption can lead to an accumulation of debt. This can trigger either default or a large fiscal adjustment in order for government to return to a sustainable path.

In countries with high levels of foreign currency debt, deterioration in terms of trade can cause a recession and can cripple public finances and debt repayments. This can result in insolvency and pro-cyclical policies mainly because when an economy is hit by economic shocks the nature of its fiscal policy changes. In some instances, governments may increase spending and reduce tax policies in an effort to support recovery.

3.1 Empirical Analysis: Model Specification, Data, Empirical Procedure and Results

In the context of cyclical models, this section deals with the issue of whether economic shocks have some role to play in explaining fiscal sustainability in the ECCU States. If fiscal policy is found to be pro-cyclical and the addition of a variable to account for economic shocks increases the impact value of the pro-cyclical variable, then we can conclude that economic shocks are important in determining fiscal sustainability. Moreover, if the economic shocks coefficient is positive we can further conclude that lower levels of economic shocks will help governments of the ECCU improve their fiscal stance/fiscal sustainability position.

(a) Model Specification

The model specification in the panel data form is as follows:

$$\Delta \log GOVEXP_{it} = \alpha_i + \beta \Delta \log GDP_{it} + \varepsilon_{it} \qquad\qquad (1)$$

where Δ is the first difference operator, *i* stands for country index, *t* represents time index and the parameter β measures the degree of cyclicality of fiscal policy. The latter cyclicality is determined by the sign and size of the coefficient β. If $\beta<0$, then fiscal policy is countercyclical; if $\beta=0$, then it is acyclical; and if $\beta>0$, then fiscal policy is pro-cyclical. The size of β gives the strength (or lack of) of the cyclicality.

Equation (1) leads potentially to biased estimators as other important variables are missing from the equation. Here we concentrate on the variable(s) which captures economic shocks as potentially a missing variable in equation (1). Indeed, in the context of the ECCU, the growth in government spending can also be determined by the changes in terms of trade (TOT) and nonfactor services (NFS) as proxy for economic shocks. Other potential candidates that can serve as proxies for economic shocks include the rate of change in tax on international trade, the price of oil and gas, the short-term interest rate and inflation rate. This study is particularly interested in capturing economic shocks through the balance of payments (BOP) account and hence the choice of TOT and NFS to measure economic shocks.

The rationale for using data from BOP is as follows. First, the ECCU States have poorly diversified economies and are excessively reliant on the exports of few commodities and tourism to generate foreign revenue. Second, the economic vulnerability of these ECCU States is compounded by their high degree of economic openness, dependence on a narrow range of exports, dependence on strategic imports and peripherality (see for example Briguglio, 1992, 1995, 1997, 2003; Briguglio and Galea, 2003; Farrugia, 2004). Third, BOP shocks will have three wider impacts. In the first instance, if the exchange rate is flexible, they commonly provoke devaluation (unless immediately offset by inflows of external finance), the devaluation causes other problems elsewhere, including inflation, and higher external debt service in domestic currency or budget revenue terms. In the second instance, BOP shocks will reduce foreign exchange reserves. Third, and most important, they impact on the fiscal sector. Indeed, they lead to lower budget revenues due to cuts in export (including tourism) or import taxes and related VAT, higher expenditures to combat the impact of shocks (especially natural disasters),

and lower (usually especially capital) expenditures if the shocks are not offset by additional

financing, or if aid shortfalls lead to cuts in spending. Hence, the model is specified as follows:

$$\Delta \log GOVEXP_{it} = \alpha_i + \beta \Delta \log GDP_{it} + \gamma_1 \Delta \log TOT_{it} + \gamma_2 \Delta \log NFS_{it} + \varepsilon_{it} \quad (2)$$

where i stands for country, t represents time, Δ is the first difference operator, *log* stands for

logarithm, TOT is the terms of trade (export prices/import prices), NFS is nonfactor services

(measuring tourism serviced revenue), $GOVEXP$ is real government expenditure, GDP is real

output and ε the error term.

  (b) Estimation Procedure

   In equation (2) the economic shock variable can be considered exogenous as well as

correlated with country-specifics effects. This is so since that variable is in general beyond the

control of a given country[1] and also affects countries differently. In specification (2), the issue

of endogeneity is very likely to particularly affect the GDP growth variable (that is, it is

correlated with the error term). Additionally, GDP growth is correlated with the country

specific effects; hence, a fixed effects model is therefore necessary. To tackle possible

endogeneity problems, we use an instrumental variable method, namely the two-stage least

squares method (FE2SLS). (see Baltagi, 2005, 113-134 for details). In this respect, the lagged

change in GDP, change in the per capita income, change in the degree of openness of the

country, change in the Terms of Trade (TOT) as a ratio to GDP, change in the non-factor service

(NFS) as a ratio to GDP, and their lags, are instrumental variable candidates.

---

1 Small countries do not affect export and import prices.

(c) Data

All data were obtained from the Eastern Caribbean Central Bank and the various Statistical Offices' balance of payments, national accounts and fiscal accounts database. The data series cover the period 1990-2008 for seven ECCU countries - Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines. The data set includes real gross domestic product (GDP), terms of trade shock (TOT), non-factor services (NFS) and real government consumption expenditure ($GOVEXP$).

The real gross domestic product (GDP), data series is used to measure output volatility (cyclicality). Government's spending as a ratio of GDP ($GOVEXP$) is used because countries that are highly vulnerable to shocks may increase their share of spending to total output. This argument is supported by Rodrik (1998) who argues that governments tend to mitigate exposure to external risk by increasing the share of domestic output which they consume. Therefore, vulnerability can motivate governments to use spending as a stabilizer. The terms-of-trade shock (TOT) measures the ratio of export prices over import prices and is a proxy for effects of trading agreements. Exports of goods and services capture the value of all goods and non-factor services provided to the rest of the world, including merchandise freight, insurance, travel and other non-factor services. The non-factor services (NFS) variable refers to all tourist expenditure.

(c) *Results*

Given that the empirical analysis is based on panel data with a time series component of a certain length, it is useful to examine the unit root properties of the variables of interest. The

presence of a unit root is examined by running two types of panel unit root tests: Levin, Lin, and

Chu (2002) (LLC) and Breitung (2000) (see Baltagi, 2005, 237-250 for details). These tests are

conducted on the variables in first differences since these variables are the ones of interest.

The results are presented in Table 1. They indicate that the null hypothesis of a unit root can be

rejected. That is, variables in 1st differences are stationary.

Table 1: Panel Unit Root Test 1st Difference

Variables	Levin, Lin & Chu	Breitung
GDP	-10.95*	-3.54*
GOVEXP	-12.68*	-3.34**
TOT	-12.63*	1.74
NFS	-10.38*	-5.11*

Note: All tests are conducted with a time trend included in the specification. The critical values at 10% (***) , 5% (**) and 1% (*) are -2.92, -3.30, and -4.23 respectively. An asterisk denotes rejection of the null hypothesis of stationarity.

The results above clearly indicate that cointegration is not an issue since all the variables

of interest are stationary. Table 2 presented the results of the fixed effects 2SLS estimation

with the following instruments: lagged change in GDP and change in TOT as a ratio of GDP and

its lagged value, and change in NFS as a ratio of GDP. Note that the first differences equation

results are short-run responses. The results show that the fiscal policy cyclicality indicator(β) is

positive and significant. Specifically, a 1 per cent increase in real output leads to a 1.36 per cent

increase in government expenditure. This outcome implies that during the period 1990-2008

fiscal policy has been pro-cyclical in the panel of the seven ECCU States.

Table 2: Cyclical Stance of fiscal policy in ECCU: 1990-2008

Estimation Method: Fixed Effects Two-Stage Least Square (FE2SLS)

Explanatory Variable	Coefficient	Standard error	t-value
$\Delta logGDP$ (cyclicality)	1.36	0.51	2.67**
No. Countries	7		
No. Observations	133		
R-Squared	0.29		
P-value	0.03		
Durbin-Watson	2.43		

*Note: The dependent variable is $\Delta logGOVEXP$. β is estimated using Equation 1. White's heteroskedasticity and autocorrelation consistent standard errors are reported. Instrumental variable is lagged GDP growth and lagged change in per capita income. ** denotes statistical significance at the 5 per cent level.*

Table 3 contains the impact results of the extended model (2). The results indicate that the impacts of the proxies for economic shocks, TOT, and NFS are significant at the 5 per cent level with coefficients $\hat{\gamma}_1$=0.06 and $\hat{\gamma}_2$=0.02, respectively. This implies that an increase in economic shocks would lead to an increase in government expenditure, $GOVEXP$. The results also indicate that pro-cyclicality increases when the TOT and NFS variables are added to the model; indeed, now 1 per cent increase in real output leads to a 1.90 percentage point increase in government expenditure; that is, a boost of 0.54 percent due to the presence of economic shocks. Since the additional variable which accounts for economic shocks increases the impact value of the pro-cyclical variable, we contend that economic shocks are important elements for inclusion in approaches for assessing fiscal sustainability.

Table 3: Cyclical Stance of fiscal policy in ECCU: 1990-2008
Estimation Method: Fixed Effects Two-Stage Least Square (FE2SLS)

Explanatory Variable	Coefficient	Standard error	t-value
$\Delta logGDP$	1.90	0.83	1.94***
$\Delta logTOT$	0.06	0.13	2.43**
$\Delta logNFS$	0.02	0.08	3.61**
No. Countries	7		
No. Observations	133		
R-Squared	0.59		
P-value	0.00		
Durbin-Watson	2.01		

Note: The dependent variable is $\Delta logGOVEXP$. White's heteroskedasticity and autocorrelation consistent standard errors are reported. Instrumental variables are lagged GDP growth, lagged change in per capita income, lagged change in TOT and lagged change in NFS. *** and ** denotes statistical significance at the 10 and 5 per cent level, respectively.

The comparison of the sizes of cyclicality in the two scenarios (Table 2 and Table 3) reveals that in the case of omission of economic shocks, there is an underestimation of the size of fiscal pro-cyclicality. In other words, there is a negative or downward bias in the cyclicality if our measure of economic shocks (that is, TOT and NFS) is omitted in the estimated model. The downward bias is confirmed by the negativity of the product $\hat{\gamma}_1 \hat{\delta}_1$ and $\hat{\gamma}_2 \hat{\delta}_2$. For recall, γ_1 and γ_2 are the coefficients representing economic shocks in equation (2) and δ_j $(j = 1,2)$ is the regression coefficient of the excluded variable (economic shocks) on the included variable (GDP growth).(see results on Tables 4A and 4B). The bias is thus given by $\gamma_1 \delta_1 + \gamma_2 \delta_2$.

Table 4A: Evaluation of δ_1

Fixed Effects 2SLS Model

Explanatory Variable	Coefficient	Standard error	t-value
$\Delta \log GDP_{it}$	-1.56	0.71	-2.17**
No. Countries	7		
No. Observations	133		
R-Squared	0.35		
P-value	0.00		
Durbin-Watson	2.95		

*Note: The dependent variable is $\Delta \log TOT_{it}$. White's heteroskedasticity and autocorrelation consistent standard errors are reported. The Instrumental variables are lagged GDP growth and lagged change in per capita income. ** denotes statistical significance at the 5 per cent level.*

Table 4B: Evaluation of δ_2

Fixed Effects 2SLS Model

Explanatory Variable	Coefficient	Standard error	t-value
$\Delta \log GDP_{it}$	-0.46	0.05	-2.37**
No. Countries	7		
No. Observations	133		
R-Squared	0.35		
P-value	0.00		
Durbin-Watson	2.95		

*Note: The dependent variable is $\Delta \log NFS_{it}$. White's heteroskedasticity and autocorrelation consistent standard errors are reported. Instrumental variable are lagged GDP growth and lagged change in per capita income. ** denotes statistical significance at the 5 and per cent level.*

A reciprocal relationship to the one used in Table 4A and Table 4B allows us to make a further statement on the relationship between (i) GDP growth and TOT growth, and (ii) GDP growth and NFS growth (see Table 5). That is, we are interested in the fixed effects model with output growth explained by TOT growth and NFS growth. In Tables 4A and 4B the coefficient is negative and significant at the 10% level. When the effect of changes in economic shocks on real output growth is estimated, the coefficient(s) is (are) negative and significant as reported in Table 5. This indicates that an increase in economic shocks would lead to a decrease in GDP. This is corroborated by the fact that economic growth in the Eastern Caribbean slowed with the removal of preferential treatment of the region's banana on the European Union market. The lowering of foreign exchange earning triggers balance of payment problems and reduces potential to attain fiscal sustainability.

Table 5: Impact of Economic Shocks on Output
Fixed Effects Model

Explanatory variable	Coefficient	Standard error	t-value
$\Delta \log TOT_{it}$	-0.87	0.32	**-3.49****
$\Delta \log NFS_{it}$	-0.64	0.25	**-3.71****
No. Countries	7		
No. Observations	133		
R-Squared	0.55		
P-value	0.00		
Durbin-Watson	2.31		

*Note: The dependent variable is $\Delta \log GDP_{it}$. White's heteroskedasticity and autocorrelation consistent standard errors are reported. ** denotes statistical significance at the 5 per cent level.*

This section reveals three major results. First, it is the case that in the ECCU countries economic shocks do have a negative association with output. Second, and more importantly, the ECCU governments have adopted pro-cyclical spending policies during the period 1980-2008. These results suggest that economic shocks in the ECCU countries have been negatively affecting public debt and fiscal sustainability. This finding is in tune with Samuel (2009)'s. Concretely, Samuel (2009) used the Hodrick-Prescott Prescott (HP) filter method to investigate the cyclicality of fiscal policy in six ECCU States (Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines) for the period 1990-2006. He concluded that "it would provide greater predictability to government expenditure and reduce the deficit bias over the business cycle, which tends to push up debt levels over time" (Samuel, 2009, 18). The empirical estimation from this study differs from Samuel (2009)'s to the extent that, in addition to TOT, we use NFS to examine the effects of economic shocks. Therefore, the third major result of this study is that the addition of economic shocks variables (that is, TOT and NFS) impacts on procyclicality.

4   Conclusion

This study has demonstrated that economic shocks can impact significantly on the fiscal sustainability of ECCU States. This is mainly because these States depend on a narrow range of export products and services for foreign revenue. Nonetheless, trade and industrial policies can be combined to reduce economic vulnerability by diversifying to a range of products in export processing zones that promote FDI in labour-intensive industries. In addition, these states are small both in their physical size and structure. As a result, these economies are open and

depend on strategic imports. These features limit ECCU States' ability and resources therefore they are unable to efficiently produce the range of goods and services required to satisfy their aggregate demand.

This study found that in instances where there is a world-wide economic slowdown or recession ECCU States' balance of trade will be affected. These states will suffer extensively because they have persistent negative balance of trade. A plunge in commodity prices and declining tourism revenues and the weakened trade agreement will lead to decline in trade revenue. These shocks have the potential to increase debt burdens, destabilize foreign private capital flows and cut investment returns and reserves. As a consequence, governments can adopt macroeconomic stabilization policies. However, expanding or contracting government expenditure rapidly for macroeconomic stabilization in the aftermath of economic shocks is difficult without either spending wastefully or compromising other fiscal policy objectives. As a consequence, ECCU States have adopted pro-cyclical policies. The economic policies used by government to smooth economic shocks are expected to be countercyclical since fiscal policies should act as automatic stabilization policies. Generally, fiscal policy instruments can contribute to the stabilization of the economy to the extent that they could stabilize output, income and demand during an economic downtown by maintaining or even increasing government expenditure, or by reducing tax revenue, thus contributing to fiscal instability.

To recall, this study stressed the importance of fiscal accounts and balance of payments on the ECCU's in analyzing the sustainability of fiscal policy. As a consequence, empirical investigation was conducted on cyclical models to deal with the issues of the type of cyclicality of fiscal policies in the concerned countries and whether economic shocks, here captured by

terms of trade and non-factor service, have some role to play in explaining fiscal sustainability in the ECCU States. Using a panel data framework with a fixed effects two stage least squares as the principal method of estimation, the empirical investigation found during the period 1990-2008 ECCU's government expenditure behaved pro-cyclically. In addition, procycality of fiscal policy increased of intensity with the addition of a variable to account for economic shocks increases. That is, economic shocks are important in determining fiscal sustainability. Finally, economic shocks negatively impact on output.

In conclusion, this study established that among the many factors that contribute to the frequent divergence of the ECCU's governments expenditure are the States' dependence on strategic imports, dependence on a narrow range of exports and economic openness. These three factors have negative effects on their fiscal sustainability. Hence, omission of variable(s) to account for economic shocks would lead to a severe bias in fiscal sustainability analyses.

REFERENCES

Arreaza, A., Bent Sørensen, and Oved Yosha. 1999. Consumption Smoothing through Fiscal Policy in OECD and EU Countries. in: James M. Poterba and Jürgen von Hagen (eds.), *Fiscal Institutions and Fiscal Performance*. University of Chicago Press.

Balassone Fabrizio & Maura Francese, 2004. Cyclical asymmetry in fiscal policy, debt accumulation and the Treaty of Maastricht. " *Temi di discussione (Economic working papers) 531,* Bank of Italy, Economic Research Department http://ideas.repec.org/p/bdi/wptemi/td_531_04.html (Accessed May 2009)

Baltagi, Badi H. 2005. *Econometric Analysis of Panel Data, 3rd Ed*.   West Sussex: John Wiley and Sons.

Breitung, J. 2000. The Local Power of Some Unit Root Tests for Panel Data. *Advanced Econometrics*, 15: 161-178.

Briguglio, Lino. 2003. The Vulnerability Index and Small Island Developing States: A Review of Conceptual and Methodological Issues. Paper prepared for the AIMS Regional Preparatory Meeting on the Ten Year Review of the Barbados Programme of Action: Praia, Cape Verde

Briguglio, Lino. 1997. Alternative Economic Vulnerability Indices for Developing Countries. Report prepared for the Expert Group on Vulnerability Index, UN(DESA), 17-19 December 1997.

Briguglio, Lino. 1995*.* Small Island States and their Economic Vulnerabilities. *World Development.* Vol. 23: 1615-1632.

Briguglio, Lino. 1992. Preliminary Study on the Construction of an Index for Ranking Countries According to their Economic Vulnerability. UNCTAD/LDC/Misc.4.

Briguglio, Lino and Waldemar Galea. 2003. Updating the Economic Vulnerability Index. *Islands and Small States Institute, Occasional Paper No. 2003/4.*

Calvo, Guillermo, Alejandro Izquierdo and Ernesto Talvi. 2003. Sudden Stops, the Real Exchange Rate and Fiscal Sustainability: Argentina's Lessons. *IADB Research Department Paper*.

Calvo, G.A., and E.G. Mendoza. 1995. Reflections on Mexico's Balance of Payments Crisis. A Chronicle of a Death Foretold. Preliminary manuscript. College Park and Washington, D.C.: University of Maryland and Federal Reserve System.

Commonwealth Secretariat. 2000. Small States: Meeting Challenges in the Global Economy. Report prepared for the Commonwealth Secretariat/World Bank Joint Task Force on Small States. Washington, DC, April.

Commonwealth Secretariat. 1985. Vulnerability: Small States in the Global Society. Report of a Commonwealth Consultative Group, Commonwealth Secretariat.

Commonwealth Secretariat, Commonwealth Advisory Group. 1997. A Future for Small States: Overcoming Vulnerability. Report by a Commonwealth Advisory Group, Commonwealth Secretariat.

Corsetti, Giancarlo and Bartoz Mackowiak. 2001. Nominal Debt and the Dynamics of Currency Crises. *CEPR Discussion Paper* No. 2929.

Corsetti, Giancarlo, Paolo Pesenti, and Nouriel Roubini. 1999a. Paper Tigers? A Model of the Asian Crisis. *European Economic Review 43*, No. 7 (June): 1211-36.

Crowards, T. 2000. An Economic Vulnerability Index for Developing Countries, with Special Reference to the Caribbean: Alternative Methodologies and Provisional Results. *Caribbean Development Bank Staff Working Papers*.

Dooley, M. 1997. A Model of Crisis in Emerging Markets. *NBER Working Paper No. 6300:* 55-78.

Easterly, W. and S. Rebelo. 1993. Fiscal Policy and Economic Growth: An Empirical Investigation. *NBER working paper* .

Fatas, Antonio & Mihov, Ilian. 2006. The macroeconomic effects of fiscal rules in the US states. *Journal of Public Economics, Elsevier, vol. 90(1-2), pages 101-117, January.*

Fatás, Antonio and Ilian Mihov. 2003. The Case For Restricting Fiscal Policy Discretion. *The Quarterly Journal of Economics, MIT Press, vol. 118(4), 1419-1447, November*.

Farrugia, N. 2004. An Alternative Index of Economic Vulnerability. *Unpublished Dissertation*, University of Malta: Department of Economics.

Funke, Norbertm Granziera, Eleonora and Imam Patrick. 2008. Terms of Trade Shocks and Economic Recovery. *IMF Working Paper W /08/36.*

Gavin, M., and R. Perotti. 1997. Fiscal Policy in Latin America. *In: B.S. Bernanke and J. Rotemberg, editors. NBER Macroeconomics Annual 1997*. Cambridge, United States: MIT Press.

Kaminsky, G., C. Reinhart and C. Végh. 2004. When It Rains, It Pours: Pro-cyclical Capital Flows and Macroeconomic Policies. NBER Working Paper 10780. Cambridge, United States: National Bureau of Economic Research.

Krugman, Paul. 1979. A Model of Balance-of-Payment Crises. *Journal of Money, Credit, and Banking*, *11*(3): 311-25.

Lane, P., and A. Tornell. 1998. Why Aren't Savings Rates in Latin America Procyclical? *Journal of Development Economics 57(1): 185-99*.

Levin, A., C. F., Lin, and C. S. J. Chu. 2002. Unit Root Tests in Panel Data: Asymptotic and Finite-sample Properties. *Journal of Econometrics*, *108:* 1–24.

Mendoza, E.G. 1997. Terms-of-trade Uncertainty and Economic Growth. *Journal of Development Economics* 54: 323–356.

Sorensen, Bent, Lisa Wu, and Oved Yosha. 2001. Output Fluctuations and Fiscal Policy: U.S. State and Local Governments 1978-1994. *European Economic Review*, Vol. 45, No. 7: 1271-1310.

United Nations. 1999. *Vulnerability and Poverty in a Global Economy: Report of the Committee for Development Policy on the first session (26-30 April 1999).* Sales No. E.99.II.A.5.

ENDNOTES

---

[i] Anguilla is a member country of the Eastern Caribbean Currency Union. It has been purposely excluded from this research for two main reasons. First, it is a British Overseas Territory; as a consequence, the UK provides financial assistance. Second, it does not have a history of significant economic, social and environmental shocks. Although Montserrat is also a British Territory and receives budgetary aid from (i.e. financial contribution to recurrent funding) it has a history of significant natural disasters and as such it has been included in this research.

[ii] Banana Wars: Power, Production and History in the Americas. *Edited by Steve Striffler and Mark Moberg.* Durham: Duke University Press, 2003. viii + 364 pp.

[iii] See for example Calvo et. al. (2003) and Samuel (2009)