IMF Working Paper

Caribbean Bananas: The Macroeconomic Impact of Trade Preference Erosion

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INTERNATIONAL MONETARY FUND

IMF Working Paper

Middle East and Central Asian Department

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March 2010

Abstract

This paper examines the macroeconomic effects of the erosion of trade preferences, with a focus on the export of Caribbean bananas to Europe. Estimates are made of the magnitude of implicit assistance provided over a period of three decades to eastern Caribbean countries through banana trade preferences. The value of such assistance rose until the early 1990s, and has declined precipitously since then. Using vector autoregressive analysis, the paper finds that changes in the level of implicit assistance have had a considerable macroeconomic impact, especially on Caribbean real GDP growth.

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I. INTRODUCTION

The banana industry of the Caribbean has enjoyed significant trade preferences for several decades. Preferential access to protected European markets has afforded Caribbean ACP (Africa, Caribbean and Pacific) producers higher export prices than otherwise, and thus provided them with implicit income transfers. Reforms to the European Union's banana regime over the last 15 years have engendered an erosion of trade preferences, and recent reforms will further erode these implicit income transfers. The erosion of trade preferences has important economic and social effects, given the dependence on banana production and exports among the Windward Islands.[2]

The countries of the Windward Islands are among the most vulnerable to terms of trade losses arising from trade preference erosion. This vulnerability arises from a large share of bananas in total exports of goods, the high degree of preferential access granted by the European Union, and their dependence on the European Union as an export market.

This paper complements previous studies by considering the macroeconomic effects of preference erosion. As a first step, the analysis measures the value of banana trade preferences, illustrating that the value of implicit assistance provided through trade preferences has declined precipitously since the early 1990s. Second, using panel vector autoregression analysis the paper discusses the macroeconomic impact of the diminution of implicit assistance, particularly on output growth in the preference-dependent Windward Islands.

The remainder of this paper is as set out below. Section II provides an historical overview of the evolution of the European Union's banana regime. Section III undertakes a brief review of the literature on the impact of preference erosion, including on the Caribbean. Section IV attempts to quantify the amount of implicit assistance, and how it has evolved over time, while Section V evaluates its macroeconomic impact. Section VI concludes.

II. HISTORICAL OVERVIEW OF EUROPEAN UNION PREFERENCE REGIMES

The Windward Islands' export banana industry was established in the early 1950s, in order to supply the United Kingdom market and replace unprofitable sugar production in the Caribbean. While at its peak in the early 1990s banana industry earnings comprised about 20 percent of Windward Islands GDP, it has subsequently declined to less than 5 percent of GDP in recent years. However, banana exports do remain important, accounting at present for about 15 percent of merchandise export receipts and remaining a key employment source in the rural districts of most of the Windward Islands.[3][4] Banana production in the Windward Islands is entirely in private hands, with the government providing some financial and other support to producers.[5]

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[2] The Windward Islands comprise the countries of Dominica, Grenada, St. Lucia and St. Vincent and the Grenadines, all of which are members of the Eastern Caribbean Currency Union (ECCU). See IMF (2009, 2008) for additional details on the macroeconomic situation of the ECCU.

[3] Windwards banana growers are typically members of their respective national banana growers' association, which purchases all export quality fruit for subsequent sale to WIBDECO (Windward Islands Banana Development and

Production yields are significantly lower in the Windwards than for other Caribbean and Latin American banana producers. Banana farms in the Windwards are typically less than ten acres in size, and are mostly located in difficult terrain (characterized by steep hillsides and narrow valleys). The combination of less favorable topography, climate, and labor conditions results in low yields per acre and relatively high production costs (NERA, 2004).[6]

For four decades prior to 1993, Windward Islands' producers enjoyed preferential access as traditional suppliers to the United Kingdom market. Prior to 1993, European Union (EU) members maintained distinct policies for banana imports, including preferential regimes for member states' overseas departments or former colonies (e.g., France imported from Martinique and Guadeloupe, Cameroon and Côte d'Ivoire, while the United Kingdom imported from the Windward Islands and other ACP countries).[7] Historically, Windward Islands bananas had been exported to the United Kingdom under preferential agreements codified in the banana protocol of the various Lomé Conventions (co-operation agreements between the then European Community and ACP countries, which commenced in 1975 and expired in 2000).

The European Union's preferential regime for bananas has undergone significant change over the last fifteen years. Along with the implementation of the EU Single Market in 1993 there came a common policy and marketing structure for banana imports. Under the so-called EU Banana Regime, preferential arrangements for ACP bananas were extended under a new import regime that encompassed the entire European Community (Dickson, 1993).

The EU banana regime operated on the basis of an annual ACP banana quota for duty-free export to the EU, and an annual quota for bananas from Latin America ('dollar' bananas) subject to a tariff. The importation of bananas into the EU also required a license, and the licensing system allowed

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Exporting Company), which markets and distributes the bananas in the United Kingdom. WIBDECO commenced operations in 1994, and is jointly owned by the governments and growers' associations of the four Windward Islands.

[4] The number of registered banana growers in the Windward Islands has fallen from about 24,000 farmers in 1993 to about 5,000 in 2005, with the number of workers deriving income from banana production exceeding the number of farmers by a factor of three. Despite these declines the industry remains a major employer, particularly in rural regions of the Windward Islands (IMF, 2002; NERA, 2004).

[5] The governments of Windward Island countries have traditionally promoted banana production by investing in support and transportation infrastructure. They have also extended fiscal incentives to banana growers to aid the industry in becoming more efficient.

[6] For a comprehensive description of problems faced by Windward Islands banana producers, see Sandiford (2000) and Myers (2004). See also Atoyen (2006) and Mlachila and Cashin (2007) for earlier examinations of the macroeconomic effects of trade preference erosion in the Caribbean.

[7] In particular, the United Kingdom allowed duty free access for bananas from the Caribbean ACP countries of Dominica, Grenada, St. Lucia, St. Vincent and the Grenadines, Jamaica, Belize and Suriname. For an historical study of the Caribbean banana trade, see Clegg (2003).

the Windward Islands the possibility of sharing in the associated economic rents (Williams and Darius, 1998). As a result, the price of bananas in the EU averaged some 80 percent more than the world (free market) price. Following World Trade Organization (WTO) rulings that the EU's banana import regime discriminated against Latin American exporters, in late 2001 the EU pledged to switch to a tariff-only system by the beginning of 2006, and requested a WTO waiver authorizing tariff preferences for ACP countries under the Cotonou Agreement (successor agreement to the Lomé Conventions) until end-2007. Under this compromise, the EU agreed that the waiver would apply only if the new tariff is set at a level that maintains total market access for all WTO member suppliers.[8]

Reforms to the EU banana regime (away from quotas to a tariff-only system) have further eroded preferences for Windward Islands' producers. Beginning January 1, 2006, the EU moved to a tariff-only regime (no quotas or licenses) with a Most Favored Nation (MFN) tariff of €176 per tonne for Latin American bananas, and a duty-free 0.775 million-tonne quota for ACP countries.[9] While the appropriate (quota-equivalent) level of this tariff has been disputed in the past (being regularly challenged by Latin American exporters), an end-2009 agreement between the major concerned parties paves the way for an end to disputation over the form and level of EU banana trade preferences.[10] [11] While the conversion of quotas into tariffs will afford some protection to ACP banana-exporting countries, Caribbean banana exporters are likely to face strong competition from more efficient African and Latin American producers. Finally, an important development in EU policies was the January 2008 implementation of the Economic Partnership Agreement between the EU and Caribbean, whereby all agricultural exports from Caribbean ACP countries (including bananas) are allowed duty-free and quota-free access to the EU.

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[8] See Borrell (1999), Guyomard and others (2004), and Williams and others (1999) for earlier analyses of the economic effects of the Single European Market.

[9] The shift to a tariff-only regime has engendered considerable controversy regarding what level of tariff protection would be equivalent to the previous quota-based regime, particularly as it pertains to maintaining market access for non-ACP suppliers. Previous EU proposals of a single MFN tariff of €230 per tonne, €187 per tonne, and later €176 per tonne were challenged by Latin American banana exporters, and all were rejected by WTO arbitrators, on the grounds that the proposed tariff would not at least maintain total market access for MFN suppliers.

[10] Recent episodes of the dispute refer to complaints by Ecuador (in November 2006) and the United States (in June 2007), requesting WTO panels to review the European Union's 'tariff-only' banana-importing regime, with both countries arguing that the regime did not comply with WTO rules as it harmed exports from Latin American countries. In 2008 the WTO panels concluded that the EU's MFN tariff introduced in January 2006 was indeed inconsistent with the EU's WTO commitments to maintain market access for MFN suppliers.

[11] On 15 December 2009, the European Commission, ACP and Latin American countries initialed an agreement on a decrease in the existing MFN tariff of €176 per tonne to an initial €148 per tonne in 2010; further cuts will be made to reach an MFN tariff floor of €114 per tonne by 2017. The European Commission also agreed on a package of financial assistance to ACP countries to assist in adjusting to this further erosion of trade preferences. In addition, Latin American countries agreed to drop their current actions against the EU in the WTO, and agreed not to seek further cuts in the banana MFN tariff. The agreement potentially brings to an end the banana trade wars, which began in 1993 with the establishment of European tariffs on banana imports from non-ACP countries.

The European Commission developed assistance plans to support the adjustment of ACP countries to its reformed (post-1993) banana regime. Assistance from the European Commission to Caribbean banana-exporting countries is being provided through: (i) the Special Framework of Assistance (1999–2008), which was designed to boost the productivity of producers, encourage diversification (away from agriculture), and provide social protection[12]; and (ii) export revenue stabilization schemes, such as STABEX. Under the SFA, between 1999 and 2008 the EU allocated about €181 million for adjustment assistance to Windward Islands ACP countries. However, the disbursement of this assistance has been slow, with (as of end-2009) about half of the allocated amounts yet to be disbursed.

III.   MACROECONOMIC EFFECTS OF PREFERENCE EROSION FOR BANANAS—LITERATURE REVIEW

A.   Global Effects of Agricultural Trade Liberalization

Agricultural trade liberalization is one of the main issues for negotiation under the Doha Round. It is also the most contentious issue, and was the main stumbling block under the Uruguay Round. Anderson and Martin (2006) note that it is ironic that agricultural policy is so contentious despite agriculture's declining role in the world economy. Nonetheless, agriculture is undoubtedly the most important activity for the majority of the world's poor, and at the same time it is the most protected sector in industrial countries. Consequently, reforms to the agricultural sector are likely to have a significant impact on a large proportion of the world's population. The most difficult aspect of the reforms is that any reform is likely to leave winners and losers, even among developing countries themselves. The poor in countries currently benefiting from trade preferences, for example, those in the Windward Islands, are likely to be worse off as a result of preference erosion, while the opposite should occur for countries that are shut out of developed country markets due to protection.

Virtually all the studies on the effects of international trade liberalization, specifically by reducing preferential trading arrangements, agree that it is globally welfare-enhancing and significant. The theoretical case for removing trade preferences can be easily made. Granting trade preferences allows the development of trade that would not exist, usually at the expense of third countries. A country that receives trade preferences enables its exporters to charge a higher price than they would if they were selling to a non-preferential market. While the extra production benefits the exporting country, there is an opportunity cost: the resources used in the production could be used more productively elsewhere, especially if the country is an inefficient producer. For the country granting preferences, there is likely to be an increase in domestic prices due to the entrance on the market of inefficient producers. For third countries, exclusion from trade preferences leads to a loss in competitiveness and therefore to lower production. This in turn can reduce its imports, therefore

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[12] The Special Framework of Assistance (SFA) was established in 1999, when the preferential trade arrangements traditionally enjoyed by ACP banana producers were found to be incompatible with WTO rules, to assist the twelve ACP traditional banana suppliers (including the four Windwards countries) adapt to the new market conditions.

leading to an overall decline in global trade (Baldwin and Murray, 1977; Stoeckel and Borrell, 2001).

As a mechanism for delivering assistance, trade preferences are particularly pernicious and inefficient, according to Stoeckel and Borrell (2001). They argue that preferential trade often diverts attention and resources from the more fundamental need of addressing the structural shortcomings that explain the underlying poor economic performance, ultimately leading to a "kiss of death". According to their estimates of EU banana preferences, it costs up to US$13 to deliver US$1 of assistance.

A simple diagrammatic presentation (adapted from Stoeckel and Borrell, 2001) illustrates the impact of providing trade preferences. Trade preferences are typically given in the form of discriminatory (vis-à-vis third parties) tariff and/or quotas. This raises the domestic price in the importing country from the international prices P1 to P3. The overall gross value of preferences is given by the difference between the preferential price P_3 and the world price with preferential access P_1 multiplied by the quantity sold, Q_1, or $(P_3-P_1)Q_1$. For the efficient producer the extra resource cost is ABE, which is much less than that for the inefficient producer P_1DEF.

Figure 1. Value of Preferences and Resource Cost
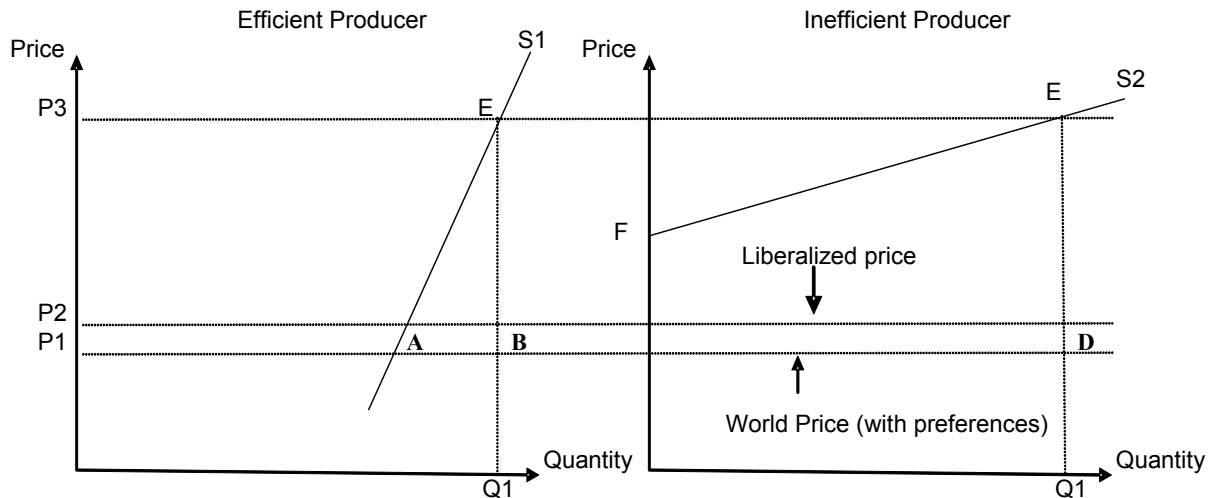
Source: Stoeckel and Borrell (2001).

There are a large number of studies that have estimated the effects of global trade liberalization. To focus on only recent substantive publications on agricultural trade liberalization under the Doha Round, key references are Aksoy and Beghin (2004), Ingco and Winters (2004), Ingco and Nash (2004), and Anderson and Martin (2006), which all find a substantial positive impact from trade liberalization from the perspective of developing countries. Aksoy and Beghin (2004) focus mainly on nine products exported by developing countries (sugar, dairy products, rice, wheat, groundnuts,

fruit and vegetables, cotton, seafood, and coffee) and analyze trends in global markets and policies. They find that the level of trade distortions is particularly high in agriculture, in most cases leading to small trade volumes and delaying the exit of noncompetitive producers. Ingco and Winters (2004), and Ingco and Nash (2004) also provide perspectives on agricultural trade issues at stake for developing countries, focusing on market access and domestic support in developed countries. They estimate that the potential gains from liberalization are of the order of US$250 billion.

Perhaps the most up-to-date assessment of the effects of agricultural trade liberalization under the Doha Round is that of Anderson and Martin (2006). Unlike the other works cited above, their book analyzes the effects of the 2004 WTO July Framework Agreement meant to establish the way forward under the Doha Round. Their book is also based on the most recent version of the Global Trade Analysis Project (GTAP Version 6.05) database and a general equilibrium framework based on the World Bank Linkage model. The key findings from Anderson and Martin (2006) are:

- The potential gains from further global trade reforms are huge, leading to an estimated boost to global welfare of about US$300 billion per year by 2015.

- Developing countries could gain disproportionately more from trade reforms: their overall welfare would increase by 1.2 percent compared to only 0.6 percent for developed countries.

- Reforms in agricultural trade, which is currently characterized by high tariff levels and subsidies, would have the biggest impact on developing countries.

- In developing countries, the poor would gain most from multilateral trade reform as factor prices for unskilled labor would increase, benefiting the vast majority of the poor. The number of people living in extreme poverty (incomes of less than a dollar a day) would decline by 32 million by 2015 (5 percent).

B. The Impact of Preference Erosion on Exporting Countries

Preference erosion can occur through a number of channels. Erosion can occur when the number of beneficiaries entitled to preferential trade treatment rises, or when a preference-granting country lowers its applied tariff while keeping its preferential tariffs unchanged, or (as in the case of the European Union's banana market) when a preference-granting country lowers its preferential tariffs (National Economic Research Associates, 2004).

There is widespread agreement that losses from preference erosion are likely to be concentrated on a few countries and products, including bananas. Two important analyses of the potential effects on middle-income and low-income countries of reduction in preferences in the United States, the EU, Canada, and Japan, find that the negative impact is concentrated in less than ten countries, and

about six products.[13] Alexandraki and Lankes (2004) demonstrate that the aggregate loss is quite small, between 0.5 and 1.2 percent of total exports of middle-income countries. However, they also show that the loss is concentrated in just three products where preference margins are high: sugar, bananas and (to a far lesser extent) textiles and clothing.[14] Countries with the greatest export losses arising from preference erosion are Mauritius, St. Lucia, and Belize, with Dominica and St. Vincent and the Grenadines also among the 10 most-affected countries. Subramanian (2003) finds that preference erosion would lead to a reduction of just 1.7 percent in the aggregate value of low-income country exports. While the losses are large in absolute terms only for a few countries such as Bangladesh, Cambodia, Mauritania, and Malawi, a number of others suffer sizable losses relative to exports.

What, in fact, is the level of preference enjoyed by developing countries? Amiti and Romalis (2006) argue that for many developing countries the actual level of preference *access* is less generous than it appears due to complex rules of origin and/or low product coverage. They find that in fact on average only 44 percent of the products are covered under the Generalized System of Preferences (GSP) in the U.S. and that the utilization rate is about 95 percent. On the other hand, while the product coverage is nearly 100 percent for the EU, the utilization rate is much lower at about 76 percent for ACP countries and 57 percent for non-ACP countries. Consequently, Amiti and Romalis (2006) argue that a general lowering of tariffs under the multilateral system is likely to lead to a net increase in market access for many developing countries, with gains in market access offsetting losses from preference erosion. In somewhat different results from Alexandraki and Lankes (2004) and Subramanian (2003), they show that the only net losers are likely to be those countries currently benefiting from a large level of preferences. In fact only two countries are identified as those which stand to lose substantially in both the EU and the U.S. markets: the Windward Islands banana-exporting countries of Dominica and St. Lucia.

C. The Impact of Preference Erosion on Caribbean Countries

From the foregoing it is obvious that banana-producing countries of the Caribbean—especially among the Windward Islands—are among the most vulnerable to preference erosion. There are a number of reasons why this is so: in a word, inefficiency, as seen above. The Windward Islands are inefficient banana producers mainly because they face two major constraints—limited, hilly and inaccessible land, and high wage levels (see Sandiford, 2000). As a result of high levels of preferences, a large number of marginal farmers went into banana cultivation until the early 1990s.

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[13] Alexandraki and Lankes (2004) examine the effect on middle-income countries of a hypothetical 40 percent cut in the preference margin for exporting countries; Subramanian (2003) focuses on low-income countries and assumes a 40 percent reduction in MFN tariffs in export markets.

[14] See Yang and Mlachila (2007) for analysis of the macroeconomic impact on Bangladesh of the erosion of textile trade preferences.

A reduction in preferences to anywhere near international prices would likely wipe out the banana industry as its production costs are above international prices (NERA, 2004).

Most existing estimates show that the loss for the Windward Islands would be large. According to the Commonwealth Secretariat (2004), if trade liberalization is aggressively pursued,[15] the result would be a reduction in exports of goods of 23 percent for St. Lucia, 13 percent for Dominica, and 11 percent for St. Vincent and the Grenadines. NERA (2004) finds that the effect of trade liberalization is quite large but varied among the various Caribbean countries. For example, on the basis of an EU tariff level close to the current €176 per tonne and individual country supply elasticities, NERA (2004) finds that banana production in the Windward Islands countries would decline by between 11-21 percent from its end-2005 level.

Impact of Banana Tariff Reduction in the Caribbean

Tariff Level (€)	Change in Banana Supply (in percent) (Assumed elasticities in brackets)				
	Belize (1.0)	Dominica (1.0)	Grenada (1.3)	St. Lucia (1.0)	St. Vincent and the Grenadines (0.7)
200	-11.3	-11.3	-14.8	-11.3	-7.9
175	-16.2	-16.2	-21.0	-16.2	-11.3
100	-30.6	-30.6	-39.6	-30.6	-21.4
75	-35.4	-35.4	-46.0	-35.4	-24.8

Source: NERA (2004).

Both Amiti and Romalis (2006), and Alexandraki and Lankes (2004) find fairly significant negative impacts of preference erosion, although the magnitude of their estimates are different. This is in part due to different supply elasticity assumptions—Amiti and Romalis (2006) use an infinite supply response, while Alexandraki and Lankes (2004) use elasticities of 1 and 2.

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[15] Under the "ambitious" scenario, there is complete elimination of export subsidies and domestic price supports, and an across-the-board reduction in bound MFN tariffs of about 30 percent and proportionately higher reductions in tariff peaks.

Impact of Banana Tariff Reduction in the Caribbean
(Export volume reduction, in percent)

	Amiti and Romalis 1/	Alexandraki and Lankes	
		Supply Elasticity = 1	Supply Elasticity = 2
Belize	-4.4	-16.1	-19.6
Dominica	-21.8	-10.2	-12.6
Grenada	...	...	...
St. Lucia	-37.6	-17.2	-20.9
St. Vincent and the Grenadines	-5.6	-6.6	-8.2

Source: Amati and Romalis (2006) and Alexandraki and Lankes (2004).
1/ Assumes supply elasticity of infinity.

In a comprehensive review of the literature on banana preference erosion, FAO (2004) makes a number of interesting observations. Contrary to the studies presented above (except for NERA, 2004)—which make *ad hoc* assumptions on tariff reductions—the studies cited in FAO (2004)[16] are more realistic as they typically measure the effects of the move to a tariff-only regime in 2006, and modify tariff levels and supply elasticities. A key finding of all the studies is that there is no tariff that would maintain the status quo—a key objective among ACP countries, especially in the Caribbean. In particular, a low tariff would undoubtedly benefit Latin suppliers and hurt EU domestic and ACP suppliers, and vice versa. However, the studies reviewed by FAO do not address the specific case of impact on the Windward Islands, as these are typically 'lumped together' with the rest of the ACP countries. Given large differences in cost structure between African and Caribbean producers, the Windward Islands would be net losers at the current tariff-only regime of €176 per tonne.[17]

It should be noted that there are virtually no existing studies that document both the implicit value of preferences and its evolution over a relatively long period. Almost all the studies reviewed here take a snapshot of the state of affairs for one year or just a few years. However, in order to understand how countries and industries have evolved to where they are now, it is useful to measure the value of preferences over time. In the next section, we attempt to do just that for the Windward Islands for a period of almost three decades.

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[16] For example, see Vanzetti and others (2004), and Borrell and Bauer (2004). The studies differ in assumptions on values and distribution of quota rent, price elasticities, and dollar/euro exchange rates.

[17] In a recent study, Anania (2009) examines the effect on banana-exporting and banana-importing countries of an agreement to reduce the EU MFN tariff on bananas to near €114 per tonne by 2016. Anania finds that given the above outturn, the volume of ACP country exports to the EU would fall by 14 percent over the 2005-16 period.

IV. QUANTIFICATION OF IMPLICIT ASSISTANCE FROM BANANA TRADE PREFERENCES

A. Methodological Considerations

The additional export revenue that Caribbean producers derive from preferential access to the European banana market represents an implicit income transfer. The amount of this implicit transfer can be calculated using a price-gap methodology—that is, the difference between the preferential European market price and the best price that could be obtained on unrestricted markets (the international market price).[18]

In line with Alexandraki and Lankes (2004), we define the preference margin (m) as the proportion by which the average unit price received by a preference recipient j exceeds that received by an MFN exporter (world price):

$$m = \frac{P^j}{P^W} - 1 \tag{1}$$

where P^j and P^W are the price received by j and the world price, respectively. The implicit value of preferences for each producer j at during a time t is simply the product of the difference in prices and the quantity exported Q^j_t (see also Section III):

$$(P^j_t - P^W_t)Q_t \quad \text{or} \quad (mP^W_t)Q_t. \tag{2}$$

There are several assumptions underlying this computation. First, it is assumed that there is no product differentiation in terms of quality, size, and origin. Second, a perfectly competitive price is assumed. Finally, all the preferential rents accrue to exporters.[19] To the extent that some of these assumptions are not verified in practice means that the computed value of preferences is likely to be somewhat exaggerated. However, this price gap method is considered by the WTO as the most transparent and objective, and far less subject to the underlying assumptions and modeling strategies used in other estimates of the values of preference (Sanchez, 2004).

A key challenge is to find comparable prices for the numerator and denominator. It is necessary to have prices such as to reflect as accurately as possible the value of preferential access *per se*, as opposed to other differences among exporters or export markets. From a theoretical perspective, it is virtually impossible to have fully comparable prices, so some element of judgment must be brought bear. This point is further discussed in Section IV.C below and in Appendix I.

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[18] For bananas, the c.i.f. (cost, insurance and freight) Caribbean prices are the European wholesale prices received by each country for their EU exports. The world banana price is proxied by the export unit price, f.o.b. (free on board), received by Central American and Ecuador banana suppliers for their exports to the (duty-free) U.S. market. See Appendix I for additional details.

[19] This methodology assumes that the entire rent from trade preference accrues to the exporting country (which tends to overestimate the implicit transfer) and that world (international) prices are not affected by preferences (which tends to underestimate the implicit transfer).

B.   Evolution of Banana Export Prices, Quantities and Values

Prices

Nominal banana wholesale prices rose steadily throughout the 1970s and 1980s, and stagnated in the subsequent two decades, before rising again in the late-2000s. The relevant price for the Windward Islands, the United Kingdom (UK) green wholesale price, rose nearly 270 percent from 1977 to its 1990s peak of US$1,020 per tonne in 1991. Beginning in the late 1990s the price declined slowly, in 2000 reaching about two-thirds of its 1991 peak. This was mainly due to increased competition from other exporters (as a result of the change in the EU banana regime), as well as retail price-cutting accompanying intense competition among retailers. Since 2001 nominal prices have recovered, reaching close to US$1,200 per tonne in 2008.
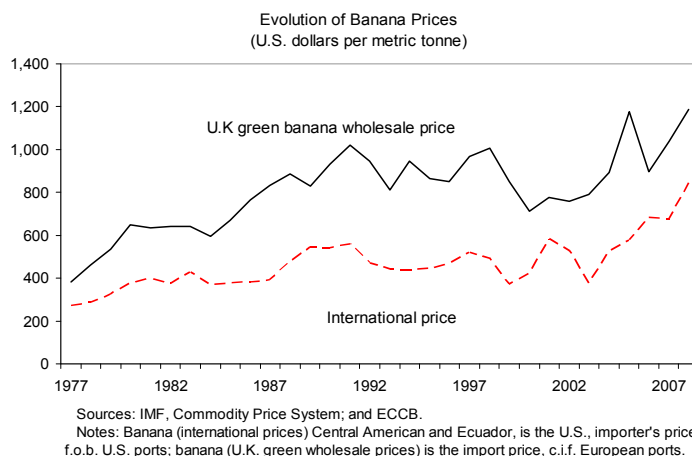
International prices moved in a similar fashion, although the rate of increase during the first part of the period was less than that observed on the UK market. Thus during 1977 to 1991, prices rose about 200 percent

Evolution of Banana Prices
(U.S. dollars per metric tonne)

U.K green banana wholesale price

International price

Sources: IMF, Commodity Price System; and ECCB.
Notes: Banana (international prices) Central American and Ecuador, is the U.S., importer's price, f.o.b. U.S. ports; banana (U.K. green wholesale prices) is the import price, c.i.f. European ports.

Evolution of Real Banana Prices
(In 2000 U.S. dollars per metric tonne)

UK green banana wholesale price

International price

Sources: IMF, Commodity Price System; and ECCB.
Notes: Banana (international prices) Central American and Ecuador, is the U.S., importer's price, f.o.b. U.S. ports; banana (U.K. green wholesale prices) is the import price, c.i.f. European ports. Dashed lines are measures of the long-run trend (smoothed versions) of the respective real price series.

to a 1990s peak of US$560 per tonne. During the 1990s prices generally remained flat, mainly as a result of increasing international competition, in part emanating from the partial liberalisation of the EU market from 1993. Since 2003 international prices have risen sharply (largely due to weather-related supply shortfalls), echoing the rapid rise in UK prices.
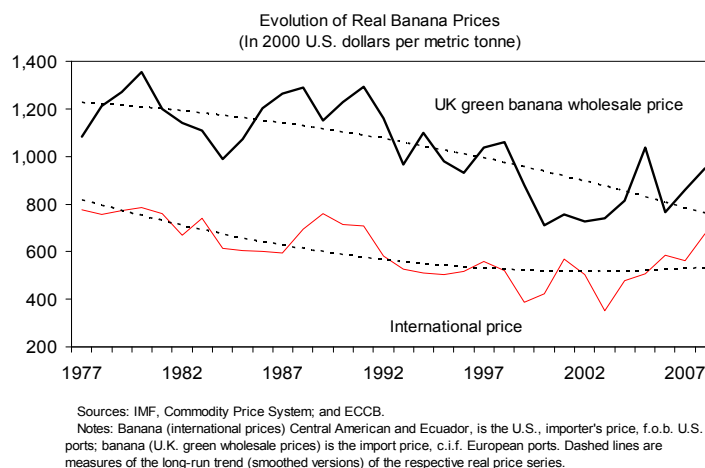
The evolution of real prices is quite interesting and show a secular downward trend throughout the period under study. UK real prices generally remained steady through the early 1990s and declined thereafter. Real international prices show a less pronounced downward trend, and have remained broadly unchanged during the 2000s.

In relative terms, UK banana prices increased during the period through the late 1980s and declined thereafter. International prices declined from about 70 percent to less than 50 percent of UK prices from 1977 to 1988. Through most of the 1990s, international prices hovered around 50 percent of UK prices, but recovered significantly from 2000 following UK price declines. Since 2006 international prices have averaged over 70 percent of UK prices.
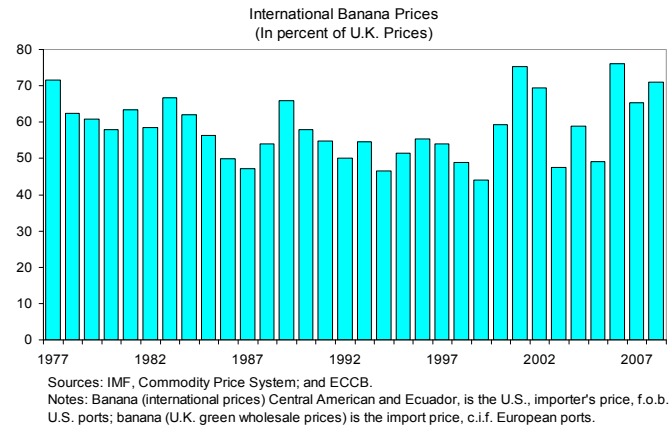
Quantities

The evolution of banana export volumes from the Windward Islands over the past three decades has an interesting bell shape. Volumes steadily rose by nearly 270 percent between 1977 and 1990 to peak at about 275,000 tonnes—virtually the same increase as that of nominal UK prices. Thereafter there was a steady decline in export volumes of about 5 percent per year on average. In fact, total volumes exported in 2008 were lower than those of 1977.
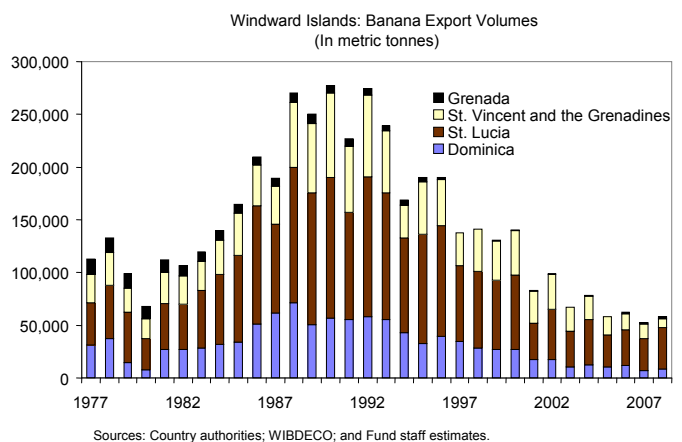
The evolution among the different islands is pretty similar to the overall trend, with one exception: Grenada. Grenada's export level was always small (about 8-12,000 tonnes annually on average), and the country stopped exporting any meaningful quantities from 1996.[20]

International Banana Prices
(In percent of U.K. Prices)

Sources: IMF, Commodity Price System; and ECCB.
Notes: Banana (international prices) Central American and Ecuador, is the U.S., importer's price, f.o.b. U.S. ports; banana (U.K. green wholesale prices) is the import price, c.i.f. European ports.

Windward Islands: Banana Export Volumes
(In metric tonnes)

Grenada
St. Vincent and the Grenadines
St. Lucia
Dominica

Sources: Country authorities; WIBDECO; and Fund staff estimates.

Windward Islands: Banana Export Earnings
(In millions of U.S. dollars)

Grenada
St. Vincent and the Grenadines
St. Lucia
Dominica

Sources: Country authorities; WIBDECO; and Fund staff estimates.

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[20] The situation changed somewhat after Hurricane Ivan (2004), which destroyed most of the main rural income earner (nutmeg trees), forcing farmers to seek alternative income sources with the export of bananas.

Values

The evolution of export values naturally reflects that of volumes and prices, and also has a bell shape. From about US$25 million (about 12 percent of GDP) in 1977, total Windward Islands exports peaked at over US$140 million (over 14 percent of GDP) in 1990. Banana exports have been particularly important for Dominica, St. Lucia, and St. Vincent and the Grenadines, accounting for about 40-70 percent of total merchandise exports, depending on the period. Since 1990, the importance of banana exports in the economy has been seriously eroded. Indeed, by 2008 total exports amounted to less than US$40 million (about 1.4 percent of GDP). The decline has been particularly precipitous for Dominica, where the banana export-to-GDP ratio collapsed from a peak of about 22 percent in 1988 to about 1.5 percent in 2008.
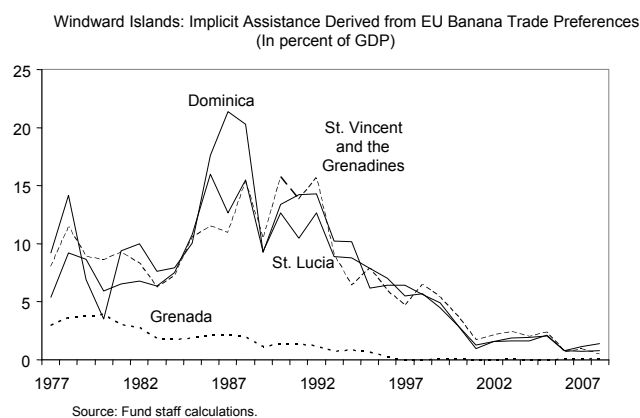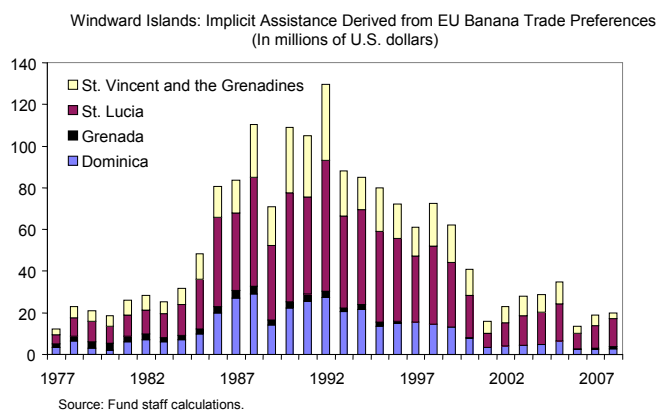
C. Estimation of Implicit Assistance

Implicit assistance (*AID*) was computed according to the formula presented above (equation (2)).

An important consideration arises as to which prices to use for the computation. There are two sets of prices that can be used. In the *first approach*, the difference between United Kingdom wholesale prices for Windward Islands banana exports and international (U.S.) landed prices for 'dollar' banana exports can be used. The *second approach* uses unit export prices for Windward Islands banana exporters and compares them with unit export prices for Latin American 'dollar' banana exporters. Both approaches have advantages and disadvantages.

Windward Islands: Implicit Assistance Derived from EU Banana Trade Preferences
(In millions of U.S. dollars)

Source: Fund staff calculations.

The first approach has the merit of being rather transparent, and has been used by the WTO for this reason. More practically, for this paper, the data for this approach is available throughout the period under study (1977-2008). However, this approach will represent the upper bound to the true amount of implicit assistance received by banana-exporting countries, as it assumes that the full margin between EU and international (free market) prices accrues to exporters. The second approach is probably closer to the lower bound of the true value of

Windward Islands: Implicit Assistance Derived from EU Banana Trade Preferences
(In percent of GDP)

Source: Fund staff calculations.

implicit assistance, as the price used is the f.o.b. (free on board) price at the point of export.[21] Nonetheless, it is conceivable that at least some of the rents do in fact accrue to exporters, especially if there is some branding of the product. The main drawback of both methods is that they assume that all bananas are created equal, i.e., they are interchangeable in the eyes of the consumer, which in fact may not be the case.[22] Ideally, prices for the numerator and the denominator in the margin computation need to be fully comparable in order to accurately allow for the computation of the preferences *per se*, abstracting from intrinsic differences between exporters and/or export markets.

Table 1 contains estimates of the implicit assistance from preferences to Windward Islands banana-exporting countries for 1995-2008. Implicit assistance (calculated using the first approach based on wholesale prices) peaked for most countries in the mid-1990s, when they were about 6 percent of GDP for Dominica, and about 8 percent of GDP for St. Lucia and St. Vincent and the Grenadines. These transfers have declined in subsequent years, mostly due to the contraction in the volume of exports, but in 2008 still comprised about 1½ percent of GDP for St. Lucia and 1 percent of GDP for Dominica.

Table 1 also computes the implicit value of preferences using f.o.b. unit export values (the second approach) for the period 1995-2008. As expected, the second method shows a similar trend to that of the first method. At the same time the computed ratios are also lower. For instance, using the first method shows that the implicit assistance-to-GDP ratio averaged 3.2 percent for the period 1995-2008 for St. Lucia, while the second method yields average implicit assistance of 1.5 percent of GDP. The true value of implicit assistance probably lies between the two measures. To the extent that the direction of the bias is known, either method could be used to estimate the impact of implicit assistance on other macroeconomic variables.

Regardless of the measure used, the level of implicit assistance delivered through EU banana trade preferences has been considerable. There are three stylized facts that emerge from an analysis of the preference calculations (here measured using the first approach). First, the value of implicit assistance has been quite high for all countries (excepting Grenada), averaging about 6 percent of GDP for the period 1977–2008. Second, the pattern of implicit assistance follows the same bell-shape as the evolution of export volumes, peaking in the late-1980s and early-1990s, and declining to levels below those observed at the beginning of the period by 2008. Finally, the level of implicit assistance for the Windward Islands has generally been higher than that of official development assistance (Figure 2). For instance, preference-based implicit assistance received by St. Lucia over the past three decades is about double that received as official development assistance.

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[21] This approach is likely to underestimate the true price gap, as use of Caribbean f.o.b. and world export prices does not reflect likely differences in the efficiency of transport and insurance between Windward Islands suppliers and their competitors on world markets.

[22] In recent years, for example, in order to recapture lost market share, an increasing volume of Windward Island bananas have been sold under the Fair Trade label, which has a price premium of about 20-25 percent over other types of bananas.

Table 1. Windward Islands: Implicit Assistance from EU Banana Preferences, 1995-2008
(In millions of U.S. dollars)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average
	(Calculations based on European wholesale and U.S. landed prices)														
Dominica	**13.6**	**15.0**	**15.5**	**14.4**	**13.0**	**7.9**	**3.4**	**3.9**	**4.3**	**4.7**	**6.4**	**2.4**	**2.5**	**2.8**	**7.8**
In percent of total export of goods and services	*12.6*	*12.3*	*11.3*	*9.5*	*8.3*	*5.5*	*2.8*	*3.2*	*3.6*	*3.6*	*4.9*	*1.7*	*1.7*	*1.9*	*5.9*
In percent of GDP	*6.2*	*6.4*	*6.4*	*5.6*	*4.9*	*2.9*	*1.3*	*1.5*	*1.6*	*1.6*	*2.1*	*0.8*	*0.7*	*0.8*	*3.1*
Grenada	**1.9**	**0.7**	**0.0**	**0.0**	**0.3**	**0.2**	**0.1**	**0.1**	**0.2**	**0.1**	**0.0**	**0.2**	**0.5**	**0.7**	**0.4**
In percent of total export of goods and services	*1.5*	*0.5*	*0.0*	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.0*	*0.2*	*0.3*	*0.4*	*0.2*
In percent of GDP	*0.7*	*0.2*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.1*
St. Lucia	**43.6**	**39.8**	**31.8**	**37.5**	**31.1**	**20.4**	**6.6**	**11.2**	**14.1**	**15.5**	**18.0**	**7.3**	**10.9**	**13.6**	**21.5**
In percent of total export of goods and services	*11.5*	*11.3*	*8.9*	*9.6*	*8.4*	*5.4*	*2.0*	*3.5*	*3.6*	*3.4*	*3.5*	*1.7*	*2.4*	*2.5*	*5.5*
In percent of GDP	*7.9*	*7.0*	*5.5*	*5.7*	*4.5*	*2.9*	*1.0*	*1.6*	*1.9*	*1.9*	*2.0*	*0.8*	*1.1*	*1.4*	*3.2*
St. Vincent and the Grenadines	**21.0**	**16.7**	**13.8**	**20.5**	**17.8**	**12.3**	**5.9**	**7.7**	**9.4**	**8.3**	**10.4**	**3.4**	**5.1**	**2.9**	**11.1**
In percent of total export of goods and services	*15.4*	*11.2*	*9.3*	*13.0*	*10.1*	*6.8*	*3.3*	*4.3*	*5.4*	*4.5*	*5.2*	*1.6*	*2.4*	*1.5*	*6.7*
In percent of GDP	*7.9*	*5.9*	*4.7*	*6.5*	*5.4*	*3.7*	*1.7*	*2.1*	*2.5*	*2.0*	*2.3*	*0.7*	*0.9*	*0.5*	*3.3*
	(Calculations based on fob unit export values)														
Dominica	**7.3**	**4.9**	**4.9**	**5.6**	**7.3**	**3.8**	**2.4**	**2.6**	**3.1**	**3.8**	**2.4**	**2.0**	**3.4**	**2.7**	**4.0**
In percent of total export of goods and services	*6.8*	*4.1*	*3.5*	*3.7*	*4.6*	*2.6*	*2.0*	*2.1*	*2.6*	*2.9*	*1.9*	*1.4*	*2.3*	*1.8*	*3.0*
In percent of GDP	*3.3*	*2.1*	*2.0*	*2.2*	*2.7*	*1.4*	*0.9*	*1.0*	*1.2*	*1.3*	*0.8*	*0.6*	*1.0*	*0.7*	*1.5*
Grenada	**0.6**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.7**	**1.6**	**2.3**	**0.4**
In percent of total export of goods and services	*0.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.9*	*1.3*	*0.2*
In percent of GDP	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.3*	*0.4*	*0.1*
St. Lucia	**17.3**	**16.0**	**10.3**	**12.9**	**15.6**	**13.6**	**5.5**	**8.5**	**7.0**	**8.8**	**7.0**	**7.6**	**7.5**	**7.6**	**10.4**
In percent of total export of goods and services	*4.5*	*4.5*	*2.9*	*3.3*	*4.2*	*3.6*	*1.7*	*2.7*	*1.8*	*1.9*	*1.4*	*1.7*	*1.6*	*1.4*	*2.7*
In percent of GDP	*3.1*	*2.8*	*1.8*	*2.0*	*2.2*	*1.9*	*0.8*	*1.2*	*0.9*	*1.1*	*0.8*	*0.8*	*0.8*	*0.8*	*1.5*
St. Vincent and the Grenadines	**8.2**	**6.6**	**4.4**	**9.1**	**9.4**	**7.2**	**3.9**	**5.2**	**4.5**	**4.7**	**4.0**	**4.2**	**4.8**	**6.1**	**5.9**
In percent of total export of goods and services	*6.0*	*4.4*	*3.0*	*5.8*	*5.3*	*4.0*	*2.2*	*2.9*	*2.6*	*2.6*	*2.0*	*2.0*	*2.2*	*3.1*	*3.4*
In percent of GDP	*3.1*	*2.3*	*1.5*	*2.9*	*2.8*	*2.1*	*1.1*	*1.4*	*1.2*	*1.1*	*0.9*	*0.8*	*0.9*	*1.0*	*1.7*
Memorandum items															
Average banana unit values for EU exports (U.S. dollars per tonne)	466	437	443	483	506	435	426	441	487	487	508	523	614	642	493
Free market (fob) unit value (U.S. dollars per tonne) 1/	276	281	310	287	267	243	260	266	262	252	266	293	281	332	277
EU export unit values (as a percent of free market prices)	169	156	143	169	189	179	164	166	185	193	191	179	219	193	178

Sources: Country authorities; IMF, World Economic Outlook; U.S. Department of Agriculture; and Fund staff estimates.

1/ Based on Ecuador bananas exported to the U.S.

Figure 2. Windward Islands: Nominal External Assistance (Official and Implicit)
(In percent of GDP)
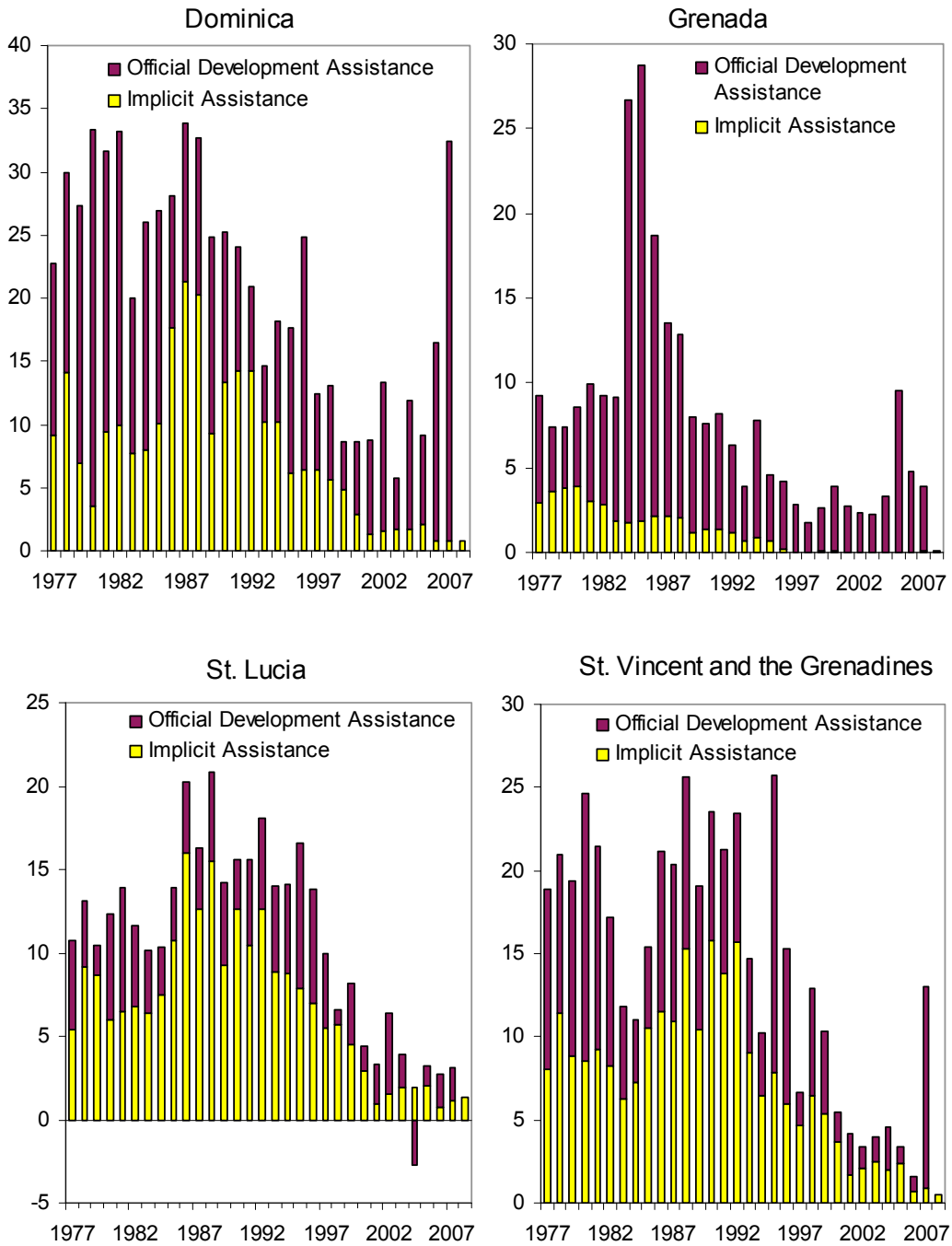
Sources: OECD; and Fund staff calculations.
Note: Official Development Assistance (ODA) as defined by the OECD includes: grants, net concessional loans (including amortization payments), and technical cooperation from official agencies (including state and local governments, or by their executive agencies).

V. ECONOMETRIC ESTIMATION OF THE MACROECONOMIC IMPACT OF IMPLICIT ASSISTANCE

A. Correlation Analysis

The variables being modeled for the period 1977-2008 for each of the four Windward Islands (see Appendix I for a full description of the data) are: implicit assistance derived from banana trade preferences (*AID*), calculated as described in Section IV; the current account balance (*CUR*); gross official reserves (*RES*); gross domestic product (*GDP*); and central government revenues (*REV*). All variables are in real terms. For reasons explained in the next section, only relationships in first differences were analyzed.

The most striking stylized fact is that changes in implicit assistance (*AID*) are positively correlated with changes in all variables, with the exception of reserves (*RES*) for Dominica and Grenada. The correlation with real GDP growth is stronger for St. Lucia (0.58) and St. Vincent and the Grenadines (0.54), while it is relatively weak for Grenada. At the Windward Islands level, the correlation is quite strong at 0.41. The overall correlation is weakest with changes in reserves (Table 2).

Table 2. Windward Islands: Correlation Between Variables (First Differences) 1/

	AID	CUR	RES	GDP	REV
Dominica					
AID	1.000				
CUR	0.118	1.000			
RES	-	0.426	1.000		
GDP	0.454	-	-0.435	1.000	
REV	0.303	-	-0.218	0.500	1.000
Grenada					
AID	1.000				
CUR	0.087	1.000			
RES	-	0.141	1.000		
GDP	0.266	-	-0.175	1.000	
REV	0.044	0.284	-0.431	0.188	1.000
St. Lucia					
AID	1.000				
CUR	0.393	1.000			
RES	0.179	0.048	1.000		
GDP	0.577	0.146	0.444	1.000	
REV	0.306	0.063	0.293	0.245	1.000
St. Vincent and the Grenadines					
AID	1.000				
CUR	0.148	1.000			
RES	0.078	0.290	1.000		
GDP	0.538	0.312	0.294	1.000	
REV	0.215	-	0.108	0.355	1.000
Overall Windward Islands					
AID	1.000				
CUR	0.153	1.000			
RES	-	0.306	1.000		
GDP	0.407	-	-0.152	1.000	
REV	0.182	-	-0.133	0.337	1.000

Source: Authors' calculations.

1/ Following Agénor et al. (2000), the approximate standard error of the correlation coefficients, computed under the null hypothesis that the true coefficient is zero is 0.18 (T=31).

B. VAR Analysis on Macroeconomic Effects of Implicit Assistance

Given the importance of implicit assistance generated through trade preferences (as identified above), it is useful to assess what its macroeconomic impact has been. Fluctuations in commodity prices, and the fluctuations in implicit assistance that they entail, can induce fluctuations in various macroeconomic aggregates and pose problems for macroeconomic management. To assess the impact of shocks to the level of implicit assistance on key macroeconomic variables, an obvious approach that has been followed in the literature is the vector autoregression (VAR) framework. VAR analysis is particularly well-adapted to the analysis of the dynamic impact of random shocks to a system of interrelated variables. For example, Deaton and Miller (1995) use this approach to estimate the impact of commodity price shocks on components of GDP in African countries. In a study specifically on the Windward Islands banana industry, Williams and others (1999) estimated the impact of banana price shocks for the economies of the Windward Islands. They used quarterly data for the period 1984 to 1996 and estimated the impact of price shocks on net foreign assets (NFA), narrow money, and government revenues. Their results showed that the impact of banana price shocks was strongest for Dominica, and that NFA was the most affected variable, while the impact on government revenues was quite minimal.

Before proceeding, the order of integration of the five variables was estimated using the Augumented Dickey Fuller (ADF) and the Phillips Peron (PP) tests. The results show that the variables are non stationary and contain a unit root (I(1)). Panel integration order was tested using Levin, Lin & Chu (LLC), Breitung (B), Im, Pesaran and Shin (IPS), ADF Fisher chi-square, and PP chi-square tests. These tests generally confirm tests at the individual country level. Table 3 shows the results of the panel integration tests for the variables in first differences, confirming that all the variables are I(0).

Table 3. Windward Islands: Panel Unit Root Tests

Variable	Test	Test statistic	Probability *	Decision
AID	Levin, Lin & Chu t* 1/	-11.2	0.000	I(0)
	Breitung t-stat 1/	-6.4	0.000	I(0)
	Im, Pesaran and Shin W-stat 2/	-10.1	0.000	I(0)
	ADF - Fisher Chi-square 2/	80.1	0.000	I(0)
	PP - Fisher Chi-square 2/	202.9	0.000	I(0)
CUR	Levin, Lin & Chu t* 1/	-8.7	0.000	I(0)
	Breitung t-stat 1/	-2.5	0.006	I(0)
	Im, Pesaran and Shin W-stat 2/	-8.7	0.000	I(0)
	ADF - Fisher Chi-square 2/	66.3	0.000	I(0)
	PP - Fisher Chi-square 2/	176.5	0.000	I(0)
RES				
	Levin, Lin & Chu t* 1/	-8.6	0.000	I(0)
	Breitung t-stat 1/	-7.4	0.000	I(0)
	Im, Pesaran and Shin W-stat 2/	-9.0	0.000	I(0)
	ADF - Fisher Chi-square 2/	74.5	0.000	I(0)
	PP - Fisher Chi-square 2/	314.8	0.000	I(0)
GDP				
	Levin, Lin & Chu t* 1/	-11.1	0.000	I(0)
	Breitung t-stat 1/	-6.2	0.000	I(0)
	Im, Pesaran and Shin W-stat 2/	-10.3	0.000	I(0)
	ADF - Fisher Chi-square 2/	83.1	0.000	I(0)
	PP - Fisher Chi-square 2/	81.2	0.000	I(0)
REV				
	Levin, Lin & Chu t* 1/	-8.5	0.000	I(0)
	Breitung t-stat 1/	-7.2	0.000	I(0)
	Im, Pesaran and Shin W-stat 2/	-9.1	0.000	I(0)
	ADF - Fisher Chi-square 2/	69.8	0.000	I(0)
	PP - Fisher Chi-square 2/	84.4	0.000	I(0)

Source: Authors' calculations.

* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution.
All other tests assume asymptotic normality.

1/ Null: Unit root (assumes common unit root process).
2/ Null: Unit root (assumes individual unit root process).

While the Engle and Granger (1987) critique is that a VAR model (in differences) tends to lead to loss of information and possible misspecification, Ho and Sorensen (1996) find that cointegration tests in small samples are weak and biased in favor of finding cointegration. For this reason, cointegration analysis is not conducted, and, consequently, a VAR model in differences appears appropriate.

The objective of the modeling is to estimate the impact and dynamics of implicit assistance (*AID*) from trade preferences on a limited number of key macroeconomic variables. We model a panel VAR of the form:

$$y_{it} = A_0 + A_1 y_{it-1} + ... + A_p y_{it-p} + \varepsilon_{it} \tag{3}$$

where y_{it} is a k vector of variables in the system to be estimated, $A_0...A_p$ are matrices of coefficients, and ε_t is a vector of innovations.

For this system, the y_{it} is a stacked vector of individual country (*i*=1,...,4)) variables: *AID, CUR, RES, GDP,* and *REV,* in that order. This Cholesky ordering is based on a priori notions about the relative endogeneity of the variables, starting with the least endogenous.[23] The appropriate lag length was estimated at 5, based on various criteria.[24]

Given that the variables are in logarithms, first differences will give percentage changes. In other words, impulse response functions can be interpreted as the percentage change in a variable following a shock to another variable of interest. In what follows, the analysis focuses only on the results of a one standard deviation transitory shock to implicit assistance (*AID*) on other variables (first column of the panel chart of Figure 3).

Several stylized facts emerge from the VAR analysis, which are estimated over a panel of Windward Islands banana-exporters for the period 1977-2008 (Figure 3). First, the impact of a positive one standard deviation shock to *AID* on all variables is positive, but statistically significant for real GDP growth only. The real GDP growth rates improves by about 1½ percentage points on impact. Second, the effect on GDP dies out after about one year.

For the Windward Islands panel, implicit assistance also explains a large share of the variability of the macroeconomic variables. Variance decompositions from the estimated VAR model show what proportion of the forecast error variance (at different forecast horizons) can be attributed to the *AID* shock. In terms of the cumulative impact on the Windward Islands (first column of the

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[23] As a robustness test, the generalized impulse response function, which does not depend on the VAR ordering, did not lead to significantly different results.

[24] Three of the tests (log likelihood, final prediction error, and Akaike information criterion) indicated 5 to be the appropriate lag length, while the Schwarz information criterion indicated a lag length of 2.

panel chart of Figure 4), the variance decomposition shows that the impact of *AID* is strongest for GDP (where it explains about 25 percent of the variance). Appendices II and III give additional information on the impulse response functions and variance decompositions of individual countries, respectively. In general, the individual results are similar to those for the panel VAR, notably that GDP is the variable most affected by changes in *AID*. As expected the impact is greatest for St. Lucia, St. Vincent and the Grenadines and Dominica, while it is fairly limited for Grenada.

The results for St. Lucia, the largest Windward Islands banana-exporting country, are of particular interest. A positive shock to the level of implicit assistance has an initially positive and significant impact on growth, and external and fiscal balances (Appendix II). The current account and the reserves growth rate both improve by about seven percentage points on impact, while real GDP and revenue growth rates improve (on impact) by about three and five percentage points, respectively. The effect of *AID* on the current account and reserves dies out after one year, while that on GDP and government revenues persists longer (lasting about two years). For St. Lucia, implicit assistance also explains a large share of the variability of the macroeconomic variables (Appendix III). The variance decomposition reveals that the impact of *AID* shocks is strongest for real GDP (where it explains about 45 percent of the variance), while for the other variables this peaks at about 25 percent.

As a robustness test, given concerns that a measure of external demand has been shown in the literature to be a key driver of growth for the ECCU countries (see for instance, Cashin (2004, 2006) and Mlachila, Samuel and Njoroge (2006)), OECD real GDP growth (*GDP_OECD*) was included as a control variable. The panel results for the Windward Islands are virtually unchanged, despite the importance of OECD growth to ECCU growth dynamics (see Appendix IV).[25]

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[25] *RES* is dropped from the analysis, given concerns about degrees of freedom. In addition, using real OECD GDP per capita growth (instead of real OECD GDP growth) does not change the results.

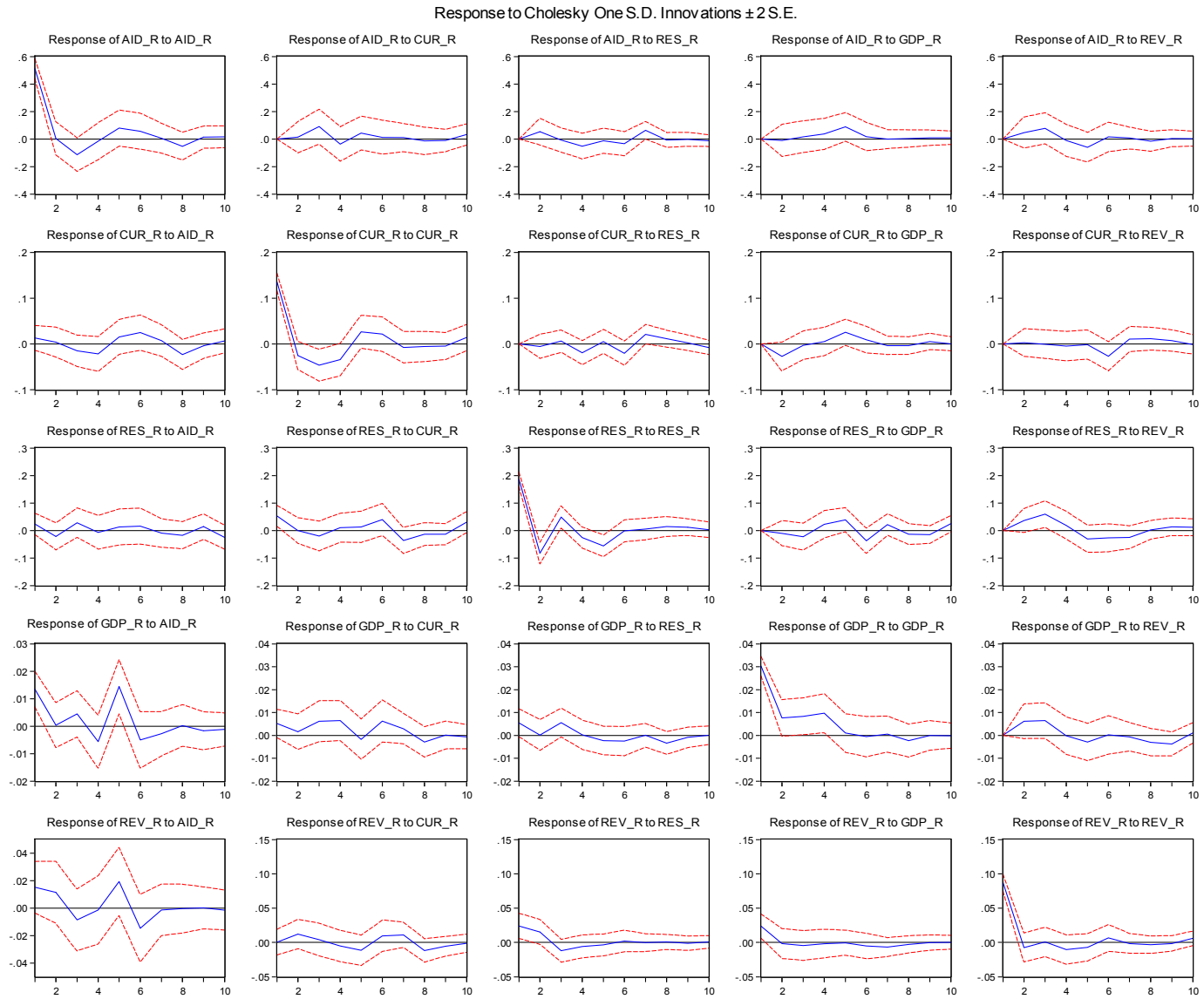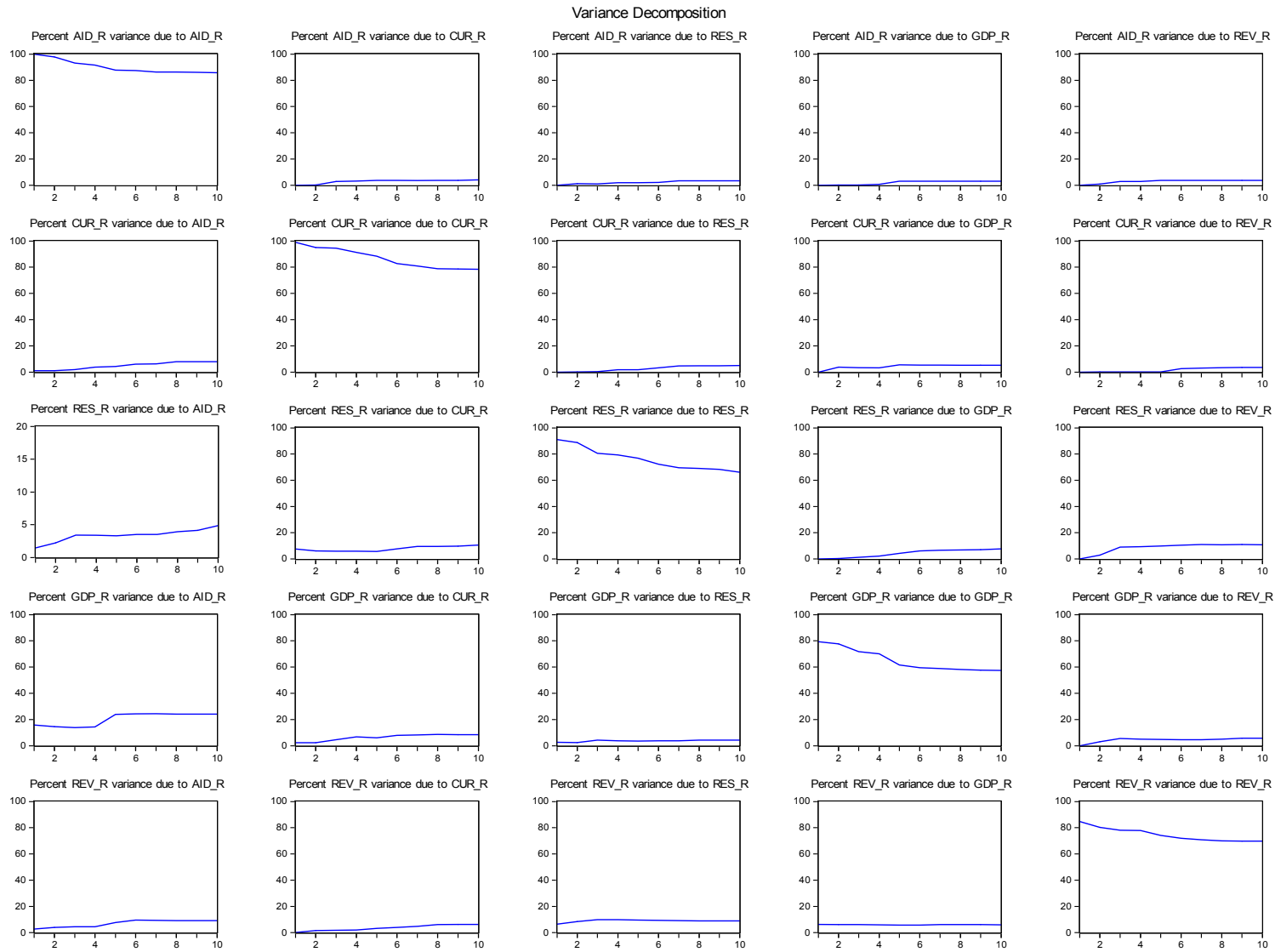# Figure 3. Windward Islands: Impulse Response Functions

Response to Cholesky One S.D. Innovations ± 2 S.E.

Figure 4. Windward Islands: Variance Decomposition

VI. CONCLUDING REMARKS

European Union trade preferences for banana exports have afforded the Windward Islands considerable—albeit declining—implicit transfers. Implicit assistance to the Windward Islands peaked at about 13 percent of GDP in the late 1980s, yet with the decline in banana production, it had fallen to about 1 percent of GDP by 2008. In tandem with dramatic declines in official development assistance, over the last two decades most of the Windward Islands have experienced the loss of annual external assistance flows equivalent to about 10 percent of GDP.

The erosion of EU trade preferences for bananas has had, and will continue to have, an adverse effect on the economies of the Windward Islands. The results from a vector autoregressive model suggest that shocks to implicit assistance (derived from trade preferences) have had a significant impact on economic growth, as well other macroeconomic aggregates, in the Windward Islands.

Although much of the macroeconomic impact of preference erosion has already been felt by these economies, the policy challenge remains to grapple with the ensuing social effects. In particular, incomes and employment prospects for poor rural households, which have limited alternative employment opportunities, have been adversely affected. This suggests the importance of well-targeted social safety nets and transition measures, such as income transfers, retraining programs, and noncontributory pensions.

Preference-dependent countries should continue in their efforts to raise the efficiency of their banana sectors and allow for the smooth shift of resources into other sectors of their economies. While significant productivity gains in bananas are unlikely for the Windward Islands, scope lies in orienting production toward fair trade and organic bananas, and in diversifying into non-banana agriculture. In the longer run, preference-dependent Caribbean economies will need to continue to transition away from agriculture and toward the provision of tourism and financial services, a shift that requires ongoing efforts to improve the investment climate, lower business costs and enhance labor force skills (see Sahay, Robinson, and Cashin, 2006).

Appendix I: Data Sources and Issues

Banana Prices

Computations of implicit assistance contained in this paper are based on price differences between protected market prices (United Kingdom/European Union) and free market international prices—the preference margin from exporting to protected European markets.

1. For calculations of preference margin based on wholesale (free-on-truck) prices:

Unit wholesale prices for the United Kingdom market

These are proxied by:

- *For the period 1975–1996:* The unit price for banana exports received by the Windward Islands in the United Kingdom. This is the c.i.f. (cost, insurance and freight) price at the port after offloading and loading on a truck, that is including the port-handling charges. Prices are available until 1999.

- *For the period 1997–2008:* World Bank unit prices for European Union banana imports (originally sourced from Sopisco News, Food and Agriculture Organization and the World Bank's own estimates). Specifically, these are the prices of Central and South American bananas—major brands (mainly Dole and Del Monte)—c.i.f. Hamburg. Prices also include European Community import taxes. The first year such prices are available is 1997.

  As a result, some discontinuity is expected in the series in 1997, due to (a) differences in discharge costs between Hamburg and London; and (b) possible differences in rents captured from bananas between Caribbean ACP (Africa, Caribbean and Pacific) countries and from Latin American banana exporters such as Ecuador, Honduras and Costa Rica.

Unit U.S. landed price of 'dollar' bananas

- Is proxied by the U.S. import price of bananas from Central America and Ecuador, f.o.b. (free on board) U.S. ports, and includes upload charges to truck or rail. This data is available from the IMF's *International Financial Statistics* database.

2. For calculations of preference margin based on unit export values:

International unit prices

These are proxied by:

- IMF data on banana exports, f.o.b., for the four Windward Islands. It is assumed that all banana exports are destined for the United Kingdom (and later the European Union) market. Data on export values and volume are taken from the Eastern Caribbean Central

Bank (ECCB) and the Windward Islands Banana Development and Exporting Company (WIBDECO), and are available for the period 1970–2008.

- Unit export price data, f.o.b., for 'dollar' bananas is proxied by the export unit price received by Central and South American banana suppliers (weighted average) for their banana exports to the (duty-free) U.S. market, as reported by the U.S. Department of Agriculture.

Banana Volumes

To calculate the *value* of implicit assistance (in terms of additional export revenues received by Windward Islands ACP countries), the preference margin for each year is multiplied by the annual volume of exports (in tonnes) for each country. Data on export volumes for the Windward Islands (Dominica, Grenada, St. Lucia and St. Vincent and the Grenadines) are taken from the Eastern Caribbean Central Bank and the Windward Islands Banana Development and Exporting Company (WIBDECO).

In the correlation and VAR analyses of Section V, the value of implicit assistance (*AID*) is derived using the preference margin (calculated using the first approach of Section IV.C— that is, as the difference between European wholesale prices for Windward Islands banana exports and international (U.S.) landed prices for 'dollar' banana exports, scaled up by the volume of banana exports of each Windward Islands country.

Macroeconomic Data

All macroeconomic data (used in the VAR analysis) on gross domestic product (*GDP*), current account (*CUR*)[26], international reserves (*RES*), central government revenues (*REV*) and real OECD GDP (*GDP_OECD*) are from IMF, *International Financial Statistics* and *World Economic Outlook* databases, completed by data from the country authorities.

For the Windward Islands, to obtain real domestic variables, all nominal variables are deflated by the national consumer price index (CPI), which is taken from the Eastern Caribbean Central Bank. An exception is nominal GDP, which is deflated by the GDP deflator (base 1990=100) and is taken from the Eastern Caribbean Central Bank. Data on international variables expressed in U.S. dollars (such as international prices and exports) are deflated by the U.S. CPI.

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[26] In order to avoid logs of negative numbers, to compute the variable *CUR* we use the approximation ln(1+current account/GDP).

Appendix II: Impulse Response Functions for Individual Countries
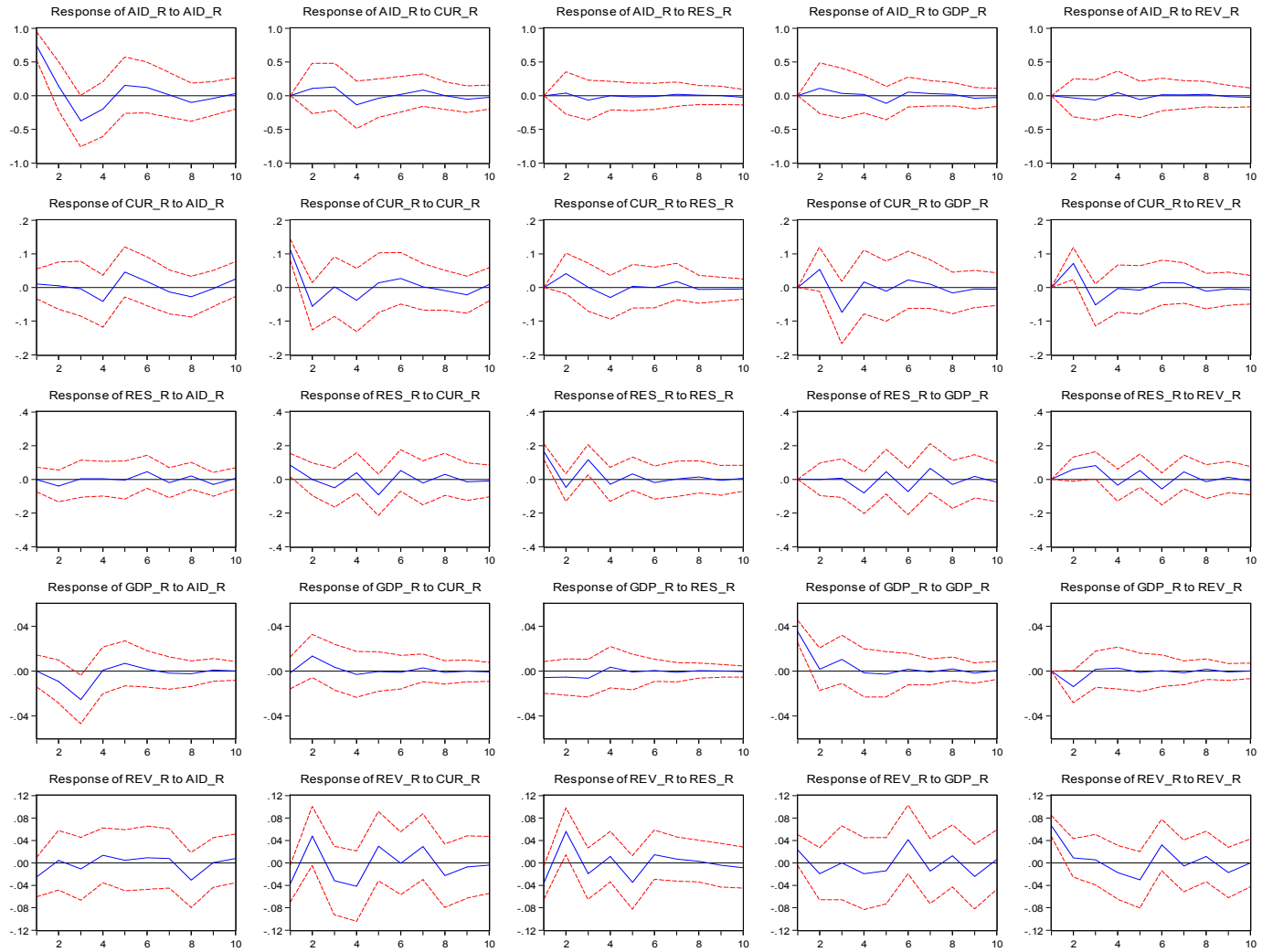
Dominica

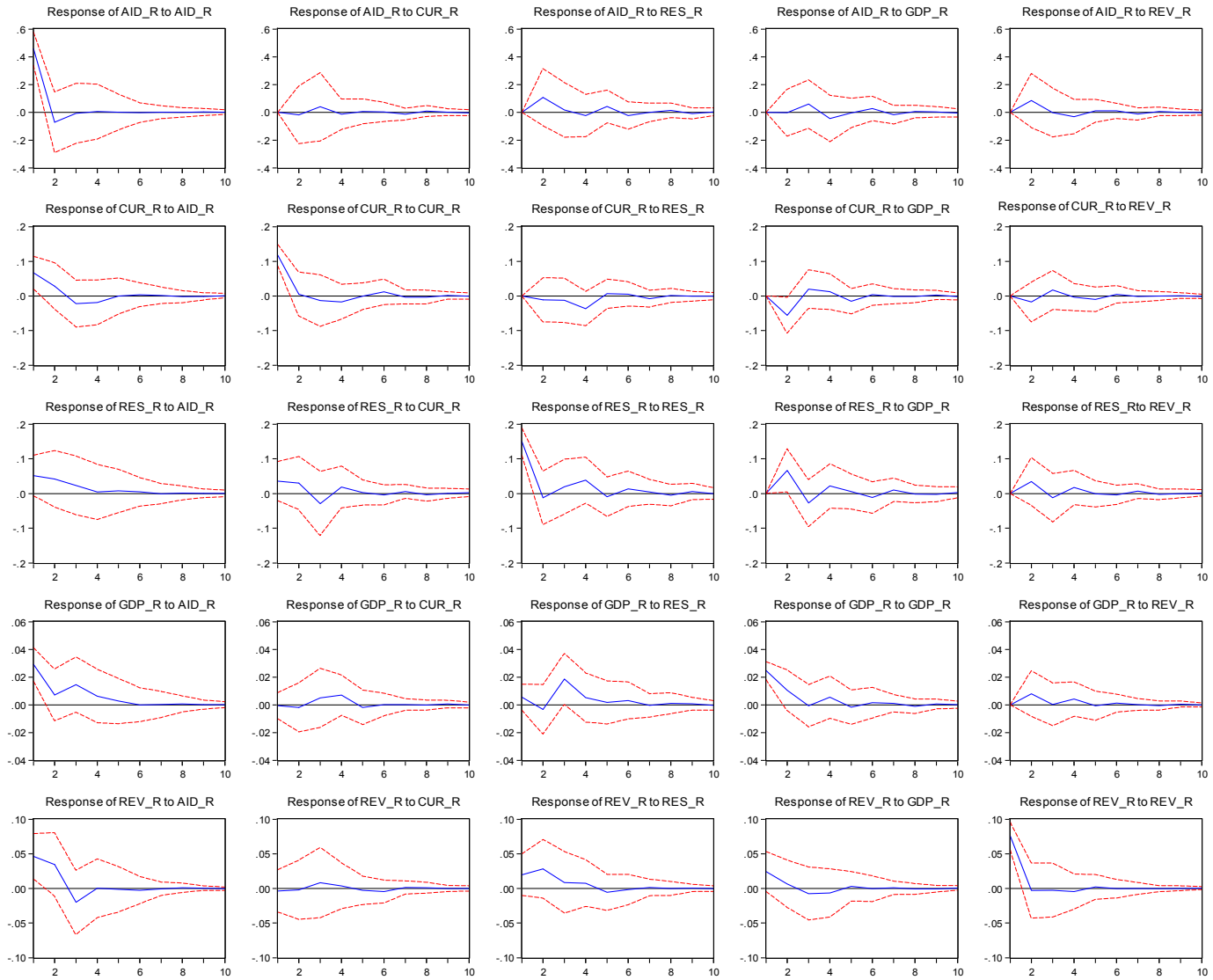Response to Cholesky One S.D. Innovations ± 2 S.E.
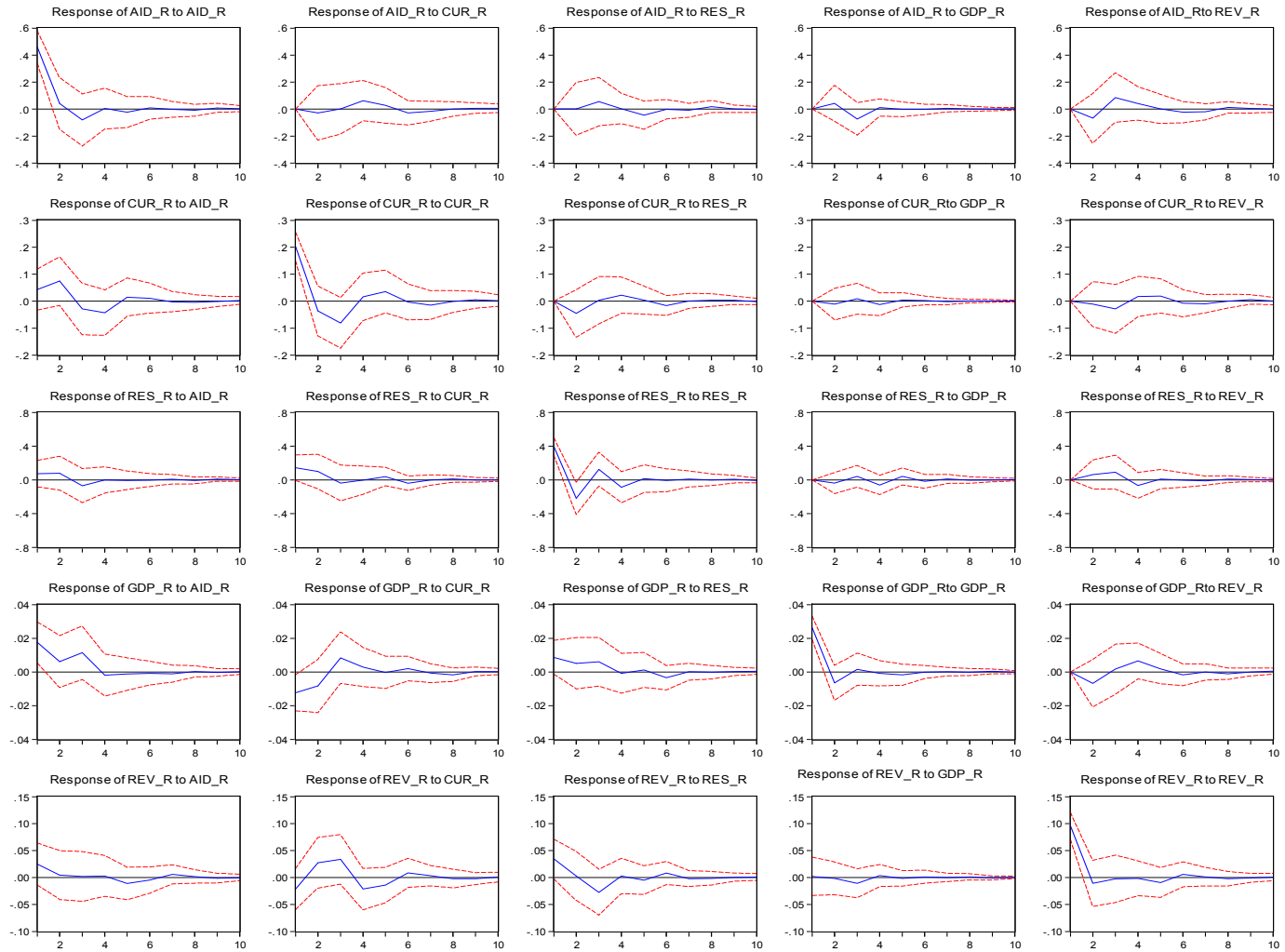
Grenada

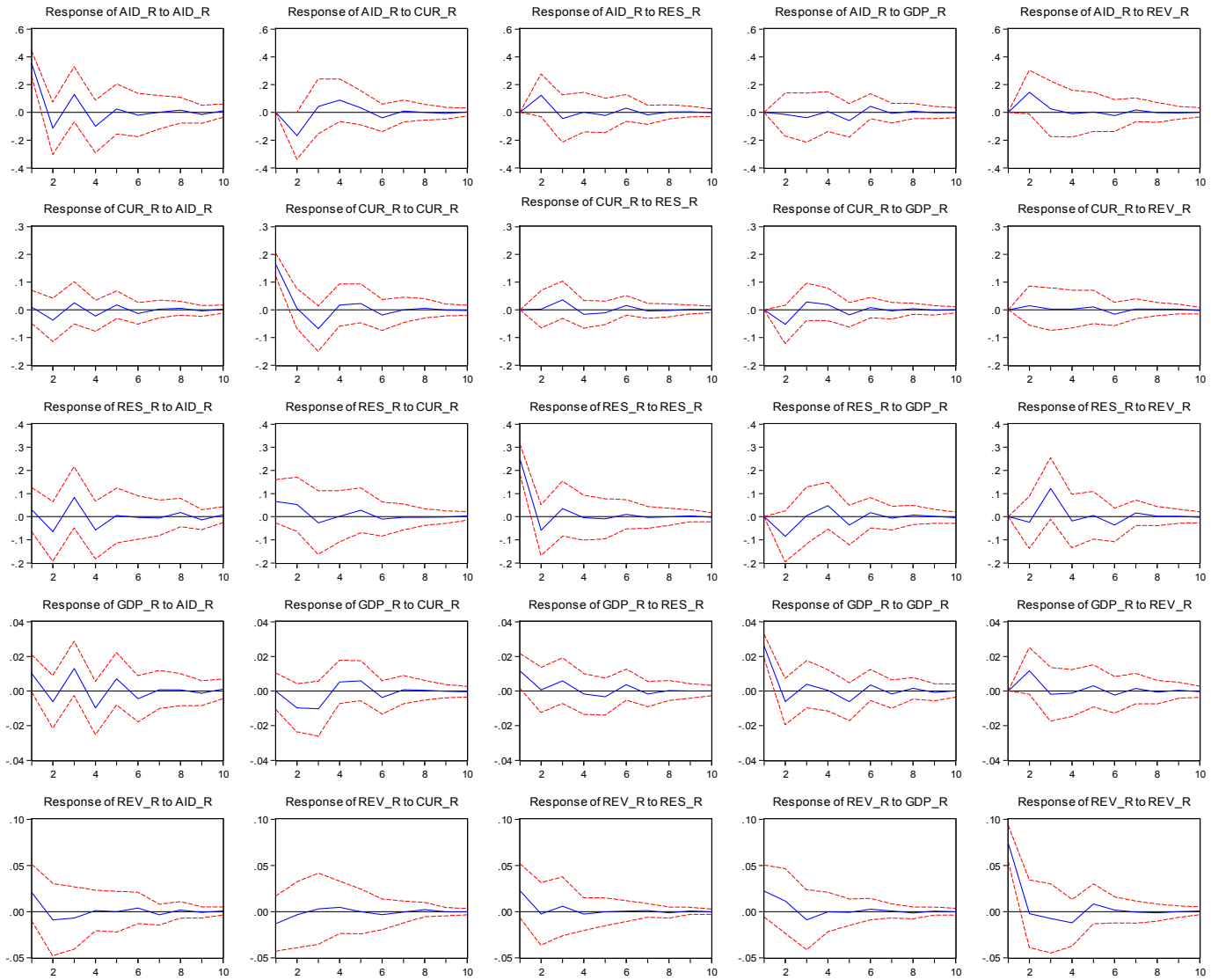Response to Cholesky One S.D. Innovations ± 2 S.E.

St. Lucia

Response to Cholesky One S.D. Innovations ± 2 S.E.
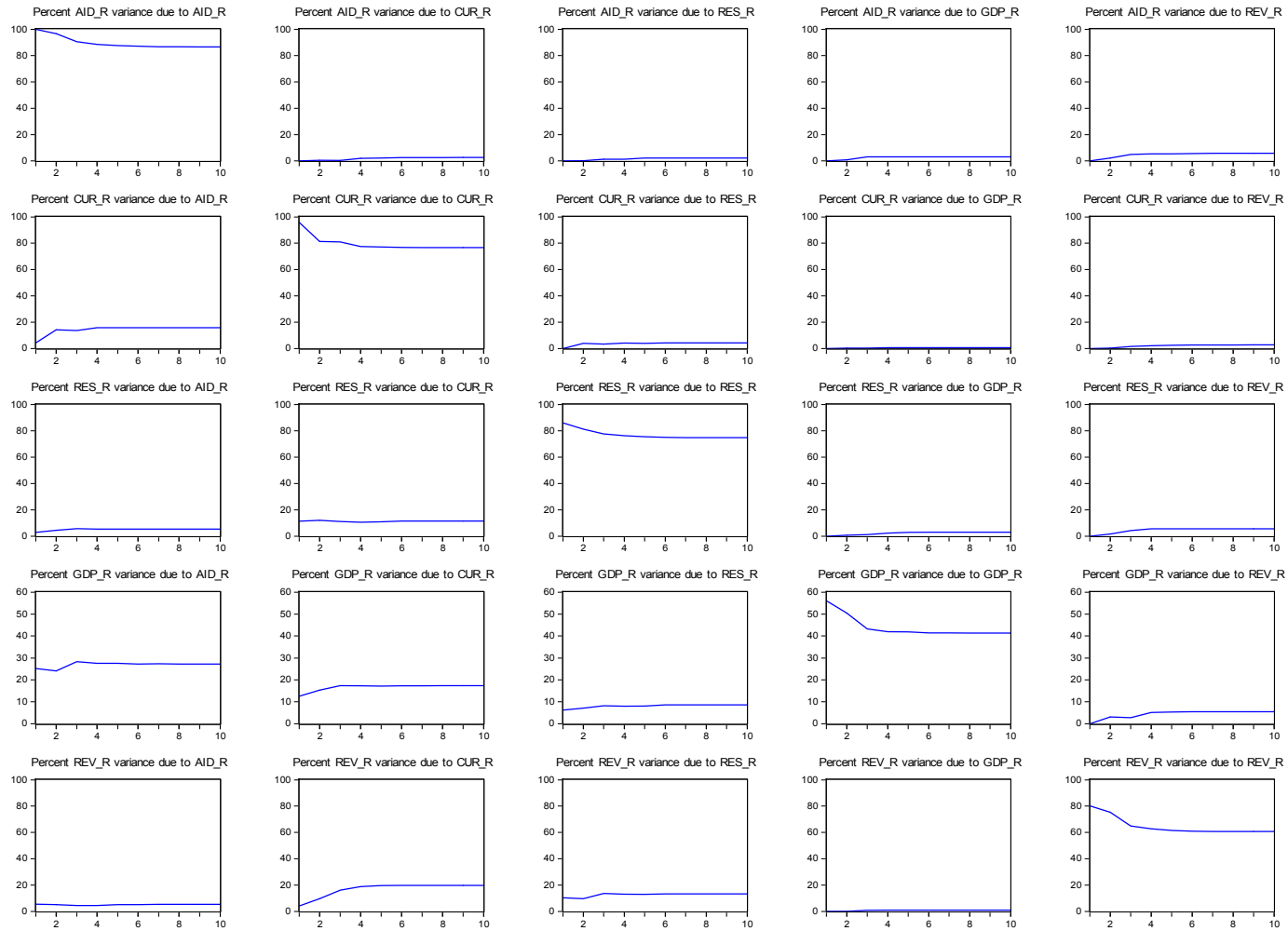
St. Vincent and the Grenadines

Response to Cholesky One S.D. Innovations ± 2 S.E.

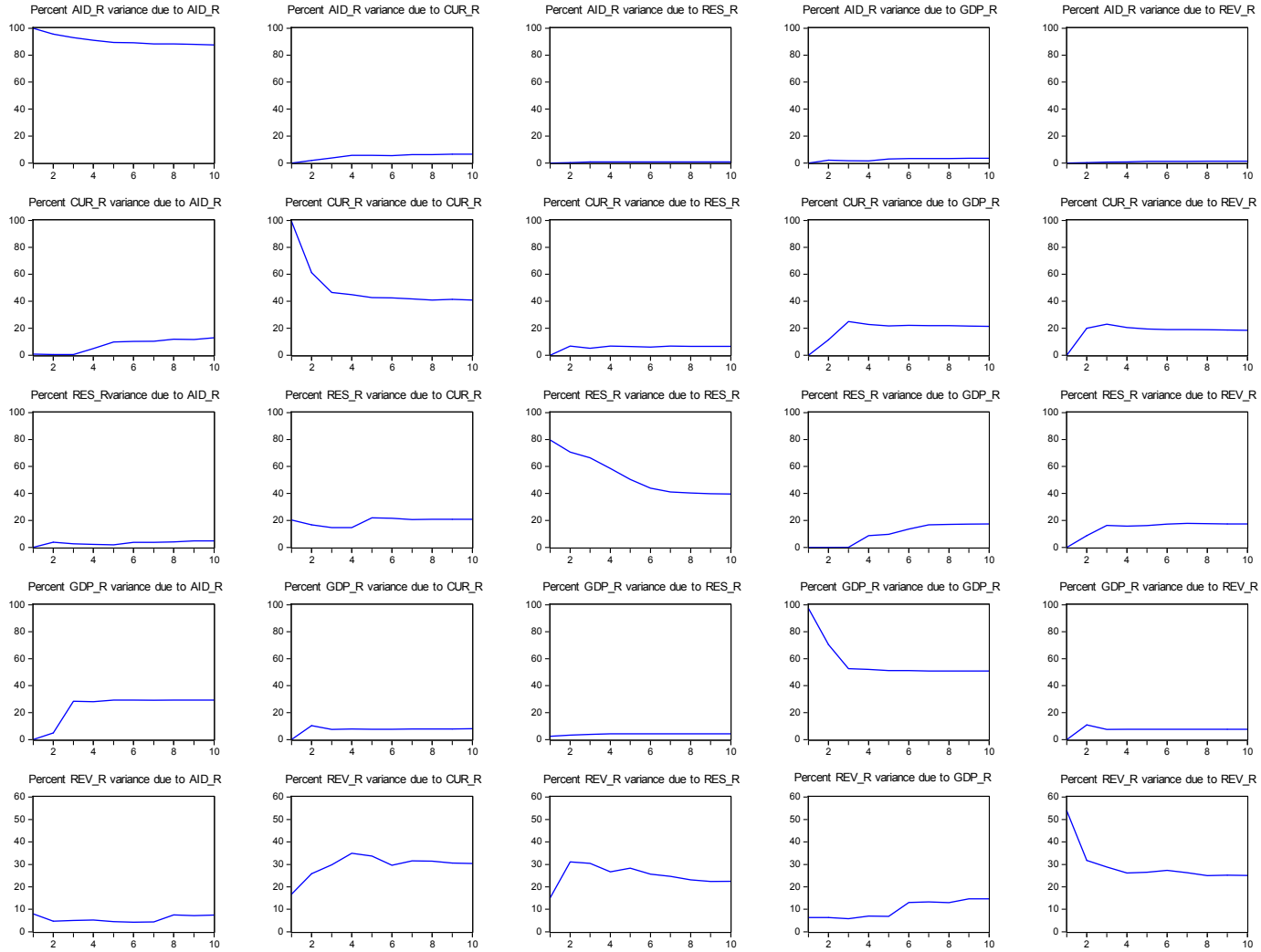# Appendix III:Variance Decomposition for Individual Countries
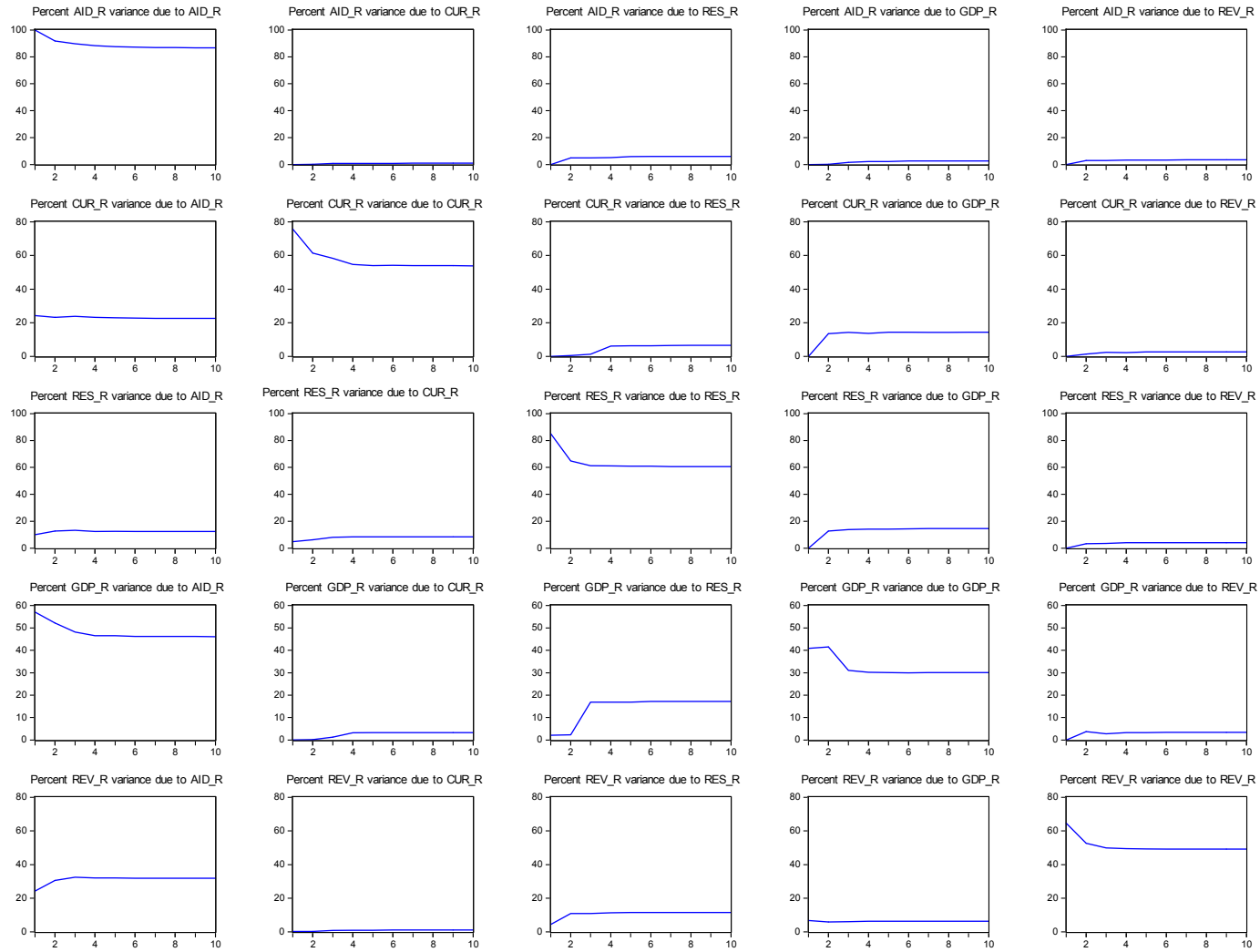
Dominica

Variance Decomposition

Grenada
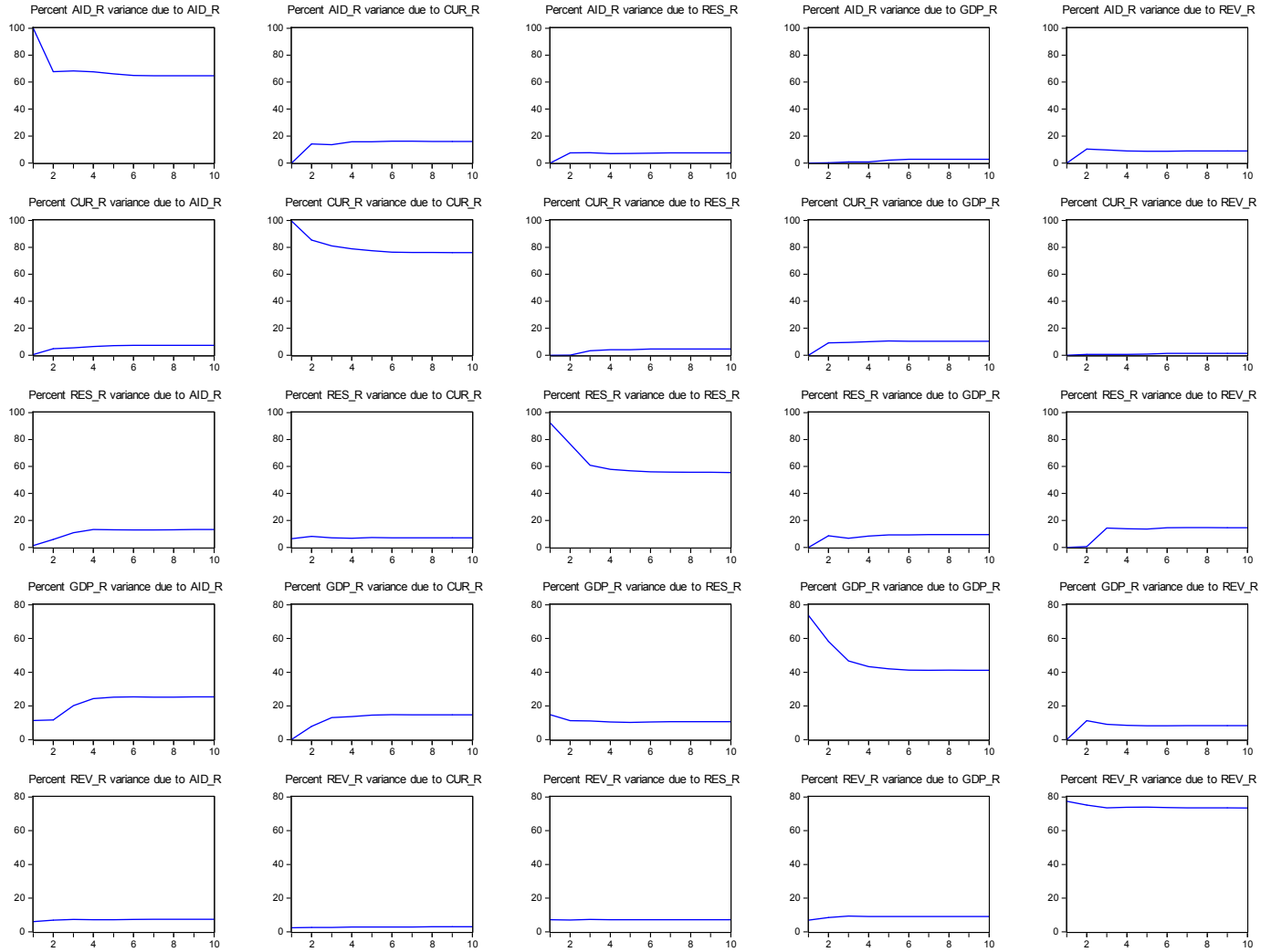
Variance Decomposition

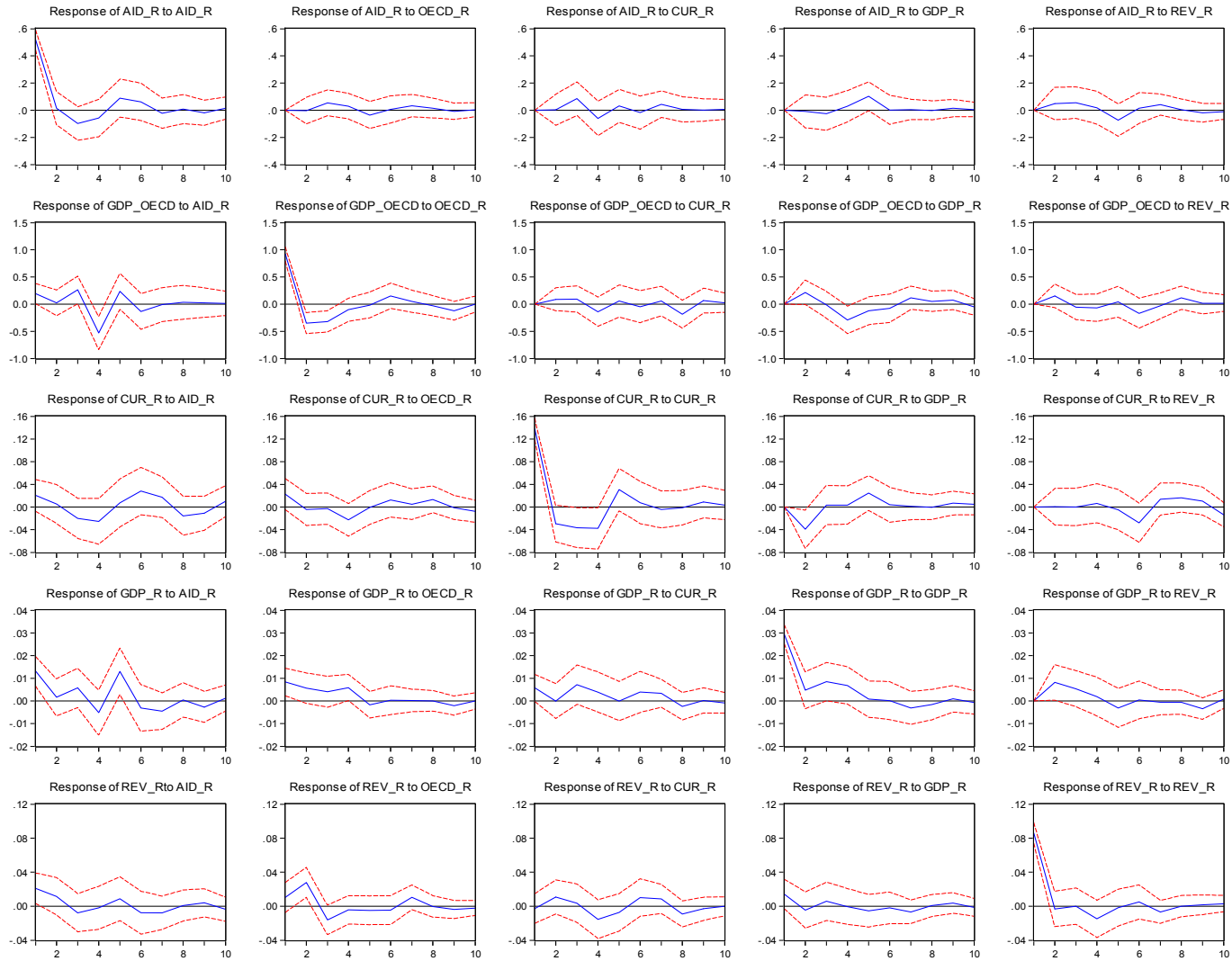# St. Lucia

Variance Decomposition

St. Vincent and the Grenadines

Variance Decomposition

Appendix IV. Windward Islands: Impulse Response Functions with Control Variables

Response to Cholesky One S.D. Innovations ± 2 S.E.

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