October 2004
IMF Country Report No. 04/335

Eastern Caribbean Currency Union: Selected Issues

This Selected Issues paper for the **Eastern Caribbean Currency Union (ECCU)** was prepared by a staff team of the International Monetary Fund as background documentation for the periodic regional surveillance on the **ECCU**. It is based on the information available at the time it was completed on **April 20, 2004.** The views expressed in this document are those of the staff team and do not necessarily reflect the views of the institutions or governments of the **ECCU** or the Executive Board of the IMF.

The policy of publication of staff reports and other documents by the IMF allows for the deletion of market-sensitive information.

To assist the IMF in evaluating the publication policy, reader comments are invited and may be sent by e-mail to publicationpolicy@imf.org.

Copies of this report are available to the public from

International Monetary Fund ● Publication Services
700 19th Street, N.W. ● Washington, D.C. 20431
Telephone: (202) 623 7430 ● Telefax: (202) 623 7201
E-mail: publications@imf.org ● Internet: http://www.imf.org

Price: $15.00 a copy

International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

EASTERN CARIBBEAN CURRENCY UNION

Selected Issues

Prepared by Paul Cashin, Jingqing Chai, Patrick Njoroge, Ruby Randall, Tobias Rasmussen, Pedro Rodriguez and Esther Suss (all WHD)

Approved by the Western Hemisphere Department

April 20, 2004

Contents Page

I. KEY FEATURES OF CARIBBEAN BUSINESS CYCLES[1]

A. Introduction

1. **The study of business cycles or the pattern of fluctuations in real economic activity has a long history in economics.** Since the seminal work of Burns and Mitchell (1946) and their colleagues at the National Bureau of Economic Research (NBER), work on cyclical instability has traditionally been concerned with analyzing the attributes of expansions and contractions in the level of economic activity, or the so-called "classical cycle." In more recent decades, spurred by the contribution of Lucas (1977) and the emerging practice of using a measure of the output gap to influence the setting of monetary policy, fluctuations in real output relative to its long-term trend (or the "growth cycle") have attracted considerable attention. Associated stylized facts, such as the co-movement of the real output growth cycle with the cyclical component of key macroeconomic series (e.g., the price level), are now quite common in the literature.

2. **While a large literature has developed analyzing the features of developed country business cycles (such as Backus and Kehoe, 1992), there have been few studies of the regularities of macroeconomic fluctuations in developing countries.** Two notable exceptions have been Agénor et al. (2000) and Rand and Tarp (2002). Nonetheless, several key questions remain unresolved—do the characteristics of macroeconomic fluctuations in developing countries differ from those of developed countries, and are the features of macroeconomic fluctuations broadly similar across developing countries? From a policy perspective these issues are also of great importance, as use of potentially inappropriate conclusions regarding the stylized facts of macroeconomic fluctuations in developing countries can adversely affect the efficacy of stabilization policy advice. Economic policy is often contingent on whether or not a country is experiencing a cyclical contraction or expansion, and so it is vital that appropriate tools be used to extract the country-specific business cycle from the data.

3. **This chapter attempts to identify and describe[2] some of the key features of Caribbean business cycles during the period 1963–2003, and will focus on several questions.** What are the key stylized facts of Caribbean business cycles? Do expansions and contractions in the level of real output have similar features, and how do they compare with

---

[1] Prepared by Paul Cashin.

[2] In describing turning points in Caribbean business cycles, the taxonomy of Mintz (1972) is followed. For the classical cycle, turning points in the level of real GDP are described as either "peaks" or "troughs", with the periods between peaks and troughs (troughs and peaks) denoted as contraction (expansion) phases. For the growth cycle, turning points in filtered real GDP are called "downturns" and "upturns", with periods between downturns and upturns (upturns and downturns) described as low-rate (high-rate) growth phases.

the business cycle defined as alternating periods of above- and below-average rates of economic growth relative to trend? Is there a relationship between movements in real output among Caribbean countries and between the Caribbean and developed countries? Is there a relationship between movements in trend-adjusted output among Caribbean countries and between the Caribbean and developed countries?

4. **As the growth cycle is defined in terms of deviations from some long-term trend, it is important to be clear about the type of detrending that is carried out on the output series analyzed in this chapter.**[3] Existing studies of the Caribbean growth cycle are predicated on the view that it is necessary to start from a stationary series.[4] Applied researchers consequently use stationary-inducing transformations, which are known to yield distorted estimates of the growth cycle (see Baxter and King, 1999; and Canova, 1998). Specific examples of such growth-cycle distorting transformations include removal of polynomial functions of time, first differencing, and the Hodrick-Prescott filter, among many others.

5. **In a recent paper, Corbae and Ouliaris (2003) propose a new approach that has superior statistical properties (in comparison with traditional ones) to estimate the growth cycle.** Using frequency domain techniques and recent developments in spectral regression for nonstationary time series, they propose an approximate 'ideal' band pass filter for estimating deviations from trend (which need not be linear). Corbae and Ouliaris (2003) demonstrate, using Monte Carlo simulations, that the new filter has superior statistical properties to the popular Baxter and King (1999) and Hodrick-Prescott (1980) filters. In particular, they show that their filter, in contrast to the Baxter-King and Hodrick-Prescott filters, is statistically consistent in the sense that the filtered series asymptotically converges to the true growth cycle.

6. **In this chapter the Corbae and Ouliaris (2003) filter is used to calibrate the Caribbean growth cycle.** Baxter and King (1999) define the "growth cycle" of the United States as movements in real GDP over the "classic" business cycle frequencies, namely cycles in GDP between 6 and 32 quarters or 2 to 8 years (see also Burns and Mitchell,

---

[3] An economic time series is composed of periodic components that lie in a specific band of frequencies. In measuring growth (or deviation from trend) cycles, we are seeking to isolate the cyclical component of an economic time series. As such, we are seeking a business cycle filter which will eliminate the slowly-evolving ('trend') component and the rapidly-varying ('irregular') component of real GDP, leaving behind the intermediate ('business-cycle') components of real GDP (Baxter and King, 1999).

[4] Earlier studies of aspects of Caribbean growth cycles have included Mamingi (1999), Borda, Manioc and Montauban (2000), and Craigwell and Maurin (2002), among others. See also De Masi (1997) for a summary of approaches taken by the International Monetary Fund in estimating growth cycles.

1946).[5] However, business cycles in Caribbean countries are likely to be quite different from those existing in developed countries, and so it would be inappropriate to apply such a rule in determining Caribbean growth cycles. Instead, the duration of typical classical business cycles of each of the Caribbean countries is calculated, and is then used as the measure of the country-specific "classic" business cycle frequencies. The peaks and troughs identified in the Caribbean growth cycle by the Corbae-Ouliaris frequency domain (FD) filter are then compared with turning points of the Caribbean classical cycle.

7. **This chapter will examine the extent to which Caribbean output co-moves with output in developed countries, and whether there is synchronization of business cycles across Caribbean countries.** It is widely recognized that macroeconomic fluctuations are related across countries, and research on the international transmission of business cycles has found evidence of positive co-movement of real output across developed countries (Backus and Kehoe (1992)**.** However, there has been little work examining the synchronization of output among developing countries.

8. **The plan of this chapter is as follows.** The data are described in Section B, along with the rules used to determine classical and growth cycles. In Section C the FD filter is used to identify the growth cycles of Caribbean countries, and a chronology for Caribbean classical and growth cycles is provided. A comparison is also made between Caribbean classical and growth cycles. Section D reports on the co-movement of Caribbean business cycles, while Section E concludes.

B. Extracting and Defining Cycles

9. **If one accepts the Burns and Mitchell (1946) definition of the business cycle as fluctuations in the level of a series within a specified range of periodicities, then the ideal filter is simply a band-pass filter that extracts components of the time series with periodic fluctuations between 6 and 32 quarters or 2 to 8 years (see Baxter and King (1999)).** In this chapter, we follow Cashin and Ouliaris (2004) and use an alternative, frequency domain, procedure for approximating the ideal band-pass filter, originally suggested in Corbae and Ouliaris (2003), which overcomes some of the shortcomings of the Hodrick-Prescott (1980) and Baxter-King (1999) time-domain based filters.

10. **The Caribbean countries analyzed in this chapter are the six Fund members of the Eastern Caribbean Currency Union** (Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines). To enable a comparison of Caribbean business cycles with those of key trading partners, business cycles in Canada, Germany, the United Kingdom, and the United States are also examined. To measure real output in each country we use the logarithm of annual real GDP (in millions of local

[5] Using high frequency data, NBER researchers specified that business cycles were cyclical components of no less than 6 quarters in duration, and which typically last fewer than 32 quarters (Burns and Mitchell, 1946).

currency, base year typically 1990), which is available for the period 1963 to 2003.[6] Real GDP for each of the ten countries during this period are shown in Figures I.1 and I.2.

11. **A key issue relates to the nature of business cycle fluctuations in Caribbean countries.** In particular, are aggregate fluctuations in these economies characterized by basic time series properties—such as volatility and persistence—that are similar to those observed for developed economies? To answer this question we examine the summary statistics for the stationary components of real output. The properties of real output growth rates (first differences of logarithms of real output) for each of the ten countries in our sample are reported in Table I.1. The mean rate of growth ranges from a low of 2.36 percent for the United Kingdom to a high of 4.91 percent for St. Kitts and Nevis. The volatility of growth rates has typically been higher for the Caribbean countries than the developed countries, reflecting the well-known tendency for greater output variability among developing countries due to the greater incidence of exogenous shocks affecting output (Mendoza, 1995; Agénor et al., 2000). Output in Caribbean countries averages about 1.6 times as variable as output of the United States; output of the developed countries is only about 1.05 times as variable as output of the United States. To examine the persistence of output fluctuations, Table I.1 also reports the first two autocorrelations of the output growth series. The autocorrelations for the Caribbean countries are typically positive, indicating that output tends to revert to its mean at a reasonably slow rate.

Chronology of the Caribbean Classical Cycle

12. **Identifying specific cycles in economic time series requires precise definitions of an expansion and a contraction.** For annual time series, an expansion phase is naturally defined as a period when the growth rate is positive; a contraction phase is obviously when the growth rate is negative. For future reference, we introduce the following definitions:

- *Definition 1*: For annual data, an *expansion* is defined as a sequence of increases in the level of output (classical expansion) and a *contraction* is defined as a sequence of decreases in the level of output (classical contraction).

- *Definition 2*: A *cycle* includes one expansion and one contraction.

In addition, and following Cashin and McDermott (2002), to avoid spurious turning points we want to rule out any mild interruptions in expansions or contractions. Accordingly, any potential change of phase that moves the cycle by less than one half of 1 percent per year is ruled out as being a turning point.

13. **The duration of phases of the Caribbean classical cycle can be determined with the assistance of these definitions.** Accordingly, these rules are used here to determine

[6] The annual national accounts GDP data are taken from the IMF's *International Financial Statistics* and *World Economic Outlook* databases.

when real GDP is in an expansionary or a contractionary phase. The rules are also adapted to determine when real GDP is in a relatively high or relatively low phase of economic growth. When the peaks and troughs in each of the time series have been dated, key features of these cycles can be measured. In particular, we can measure the duration and amplitude of expansions and contractions in Caribbean output.

14. **Importantly, the duration of classical business cycles in Caribbean countries can be used to determine the cyclical component of the real output data.** In determining the cyclical component of output series for each country, the Burns-Mitchell rule is followed whereby the minimum cycle length is two years, while the upper bound to the cycle length is the average cycle length (that is, the mean duration of expansions and contractions). As a consequence, the duration of classical business cycles is allowed to vary across countries.

15. **Contractions (expansions) are then described as periods of absolute decline (rise) in the real GDP series, not as a period of below-trend (above-trend) growth in the series (see Watson, 1994).** Figures I.1 and I.2 present the peak and trough dates for developed-country and Caribbean real GDP. The dashed lines represent the trough dates and the solid lines the peaks, with contractions (peak to trough movements) denoted by shading and expansions (trough to peak movements) denoted by no shading. Compared with expansions, it is clear that contractions (absolute declines) in Caribbean real GDP are relatively rare, and short-lived, events.

Chronology of the Caribbean Growth Cycle

16. **The variant of the rule used here to date the Caribbean growth cycle essentially follows the classical cycle-dating rule outlined above.** The rule is formally defined as follows:

- *Definition 3*: For annual data, a growth-cycle expansion (or *high-rate phase*) is defined as a sequence of increases in the positive deviation of output from trend, and a growth-cycle contraction (or *low-rate phase*) is defined as a sequence of increases in the negative deviation of output from trend.

- *Definition 4*: A completed *growth cycle* includes one high-rate phase and one low-rate phase.

Again, to avoid spurious turning points we want to rule out mild interruptions in growth-cycle phases. Accordingly, any potential change of phase that moves the growth cycle by less than one-half of 1 percent is ruled out as being a turning point. Low-rate (high-rate) phases are then described as periods of below-trend (above-trend) growth in real GDP, and so this rule dates "growth cycles," as described by Mintz (1972).

17. **Given this definition of the business cycle, the cycle-dating rule set out above is followed in analyzing Caribbean output data.** For example, using this rule the classical business cycle for Caribbean countries ranges between: Antigua and Barbuda (2 and 13 years); Dominica (2 and 11 years); Grenada (2 and 9 years); St. Kitts and Nevis (2 and 15 years); St. Lucia (2 and 20 years); St. Vincent and the Grenadines (2 and 7 years). In comparison, the classical business cycle for the developed countries ranges between: Canada

(2 and 9 years); Germany (2 and 9 years); United Kingdom (2 and 8 years); and the United States (2 and 6 years) (see Table I.2).[7] To derive the growth cycle, we apply the FD filter to each country's real output series, allowing the FD filter to 'pass through' each country's business cycle frequencies. For example, in calculating the growth cycle of Dominica using annual data, the FD filter is akin to a high-pass filter that removes low frequency components of the data (with periodicity greater than 11 years).

18. **Using the FD filter to detrend the real output series differs from the standard practice of using the HP filter and imposing a common value of the smoothing parameter (typically λ=100) on annual data from all countries.** Translating the FD approach into a HP setting, the FD approach implicitly allows for the choosing of an optimal value of λ for each output series. A virtue of the FD approach is that *a priori* assumptions about the smoothing parameter are not required, and the parameter does not have to be held constant across all series. Simulations seeking to approximate the FD-filtered output by applying the HP filter indicate that for Caribbean countries, the optimal value of the smoothing parameter typically exceeds 100. Such high values of the smoothing parameter would also be consistent with allowing to pass through components of the data with cycles greater than eight years—this is consistent with the typical duration of Caribbean classical business cycles as measured in this chapter. For the developed countries, the value of the smoothing parameter was much closer to the 'traditional' value.

19. **The standard deviation, skewness, and kurtosis of each of the HP and FD filters applied to real GDP are given in Table I.2.** Irrespective of the filtering method used, for the six Caribbean countries there is typically evidence of negative skewness in the real GDP growth cycle, indicating larger downward spikes in real GDP growth than upward spikes. For the Caribbean countries the FD filter typically displays positive kurtosis, implying an empirical distribution that has tails thinner than the normal distribution (leptokurtic). That is, large movements in Caribbean (filtered) output are relatively common.

20. **Figures I.3 and I.4 present for each of the ten countries the filtered (or detrended) real GDP derived from the FD filter.** For each country there are several downswings and upswings in this series, with the period between these turning points being described as the low-rate and high-rate phases of each country's growth cycle. Clearly, for many countries there are several phases which are rather short-lived, and it is unlikely that an upturn in economic growth, for example, would be declared on the basis of only one or two years of above-trend growth (and likewise for a downturn). In order to formally identify the duration of low-rate and high-rate phases of the developed country and Caribbean growth cycles, the cycle-dating rules set out in Section B are used to identify turning points in annual

[7] It should be noted that following the Burns-Mitchell rule using annual real output data yields a business cycle for the United States (2 to 6 years) which is slightly shorter in duration than that which is generally accepted (2 to 8 years). A reason for the difference could be that the latter cycle duration is typically derived using data observed at high frequency.

growth cycle data (as measured by the FD filter). The dashed lines represent the upturn dates and the solid lines the downturns, with low-rate phases (periods of downturn to upturn movement) denoted by shading and high-rate phases (periods of upturn to downturn movement) denoted by no shading. In contrast to the classical cycle, low-rate phases are relatively frequent, and often long-lived, events.

C. Comparison of Classical and Growth Cycles

21. **In a growing economy high-rate phases must coincide with expansion phases in the classical cycle, yet low-rate phases may be associated with either phase of the classical cycle.** However, classical contraction phases must be associated with low-rate phases in the growth cycle. While growth-cycle downturns tend to lead classical-cycle peaks, growth-cycle upturns tend to coincide with or lag classical-cycle troughs. Accordingly, it should be expected that high-rate phases will tend to be shorter-lived than expansion phases, and that low-rate phases will tend to be longer-lived than contraction phases.

22. **There are clearly more turning points in the Caribbean growth cycle than in the Caribbean classical cycle.** For example, St Lucia has only one completed (peak-to-peak) classical cycle and five completed (downturn-to-downturn) growth cycles over the sample period. For St. Lucia, since 1963 there have been two contractionary phases of the classical cycle, with many more (six) periods of low-rate (below-trend) phases of the growth cycle. On four occasions, low-rate phases of the growth cycle interrupted classical expansions, but did not terminate them. As shown in Figures I.2 and I.4, downturns in the growth cycle tend to lead peaks in the classical cycle, while upturns in the growth cycle tend to be coincident with (or slightly lag) troughs in the classical cycle. Interestingly, while real GDP for St. Lucia was in a contractionary phase only about 5 percent of the time between 1963–2003, its real GDP growth was below trend about 44 percent of the time during the same period.

23. **In addition to information on the attributes of real GDP and GDP growth cycles, Figures I.5 to I.8 also report on the salient features of movements in real GDP and real GDP growth between these turning points.** For each of the two series, the data is split into two phases: expansion and contraction phases (for the classical cycle) and high-rate and low-rate phases (for the growth cycle). For each phase, we present results for: the average duration of the phase measured in years; and the average amplitude of the aggregate phase movement in output (in percent change)—a measure of the deepness of the phase movement.

24. **The results in Figure I.5 imply that an important stylized fact of classical cycles is that they are asymmetric: contractions in real GDP are considerably shorter in duration than real GDP expansions.** For Antigua and Barbuda, the typical length of contractions (about 1 year) is about one-twelfth as long as the typical length of expansions, giving an average cycle (peak-trough-peak movement) of about 13 years. The amplitude (percent change) measure (Figure I.6) shows that the average decline in real GDP during contractions (about 3 percent) is considerably smaller than the average rise during expansions (about 50 percent). This differing relative amplitude obviously results in an overall upward

trend in Antigua and Barbuda real GDP. The speed with which real GDP changes in contractions in comparison with expansions can be determined by examining the relative annual amplitude. For Antigua and Barbuda, the average annual amplitude of real GDP rises in expansions (about 4 percent a year) is slightly faster than the annual amplitude of real GDP declines in contractions (3 percent a year). Averaging across all six Caribbean countries, the typical length of expansions is about 11½ years, which is about 10½ years longer than the typical length of contractions, giving an average Caribbean classical cycle length (peak-trough-peak movement) of about 12½ years.

25. **In comparing phases of classical and growth cycles, the average Caribbean classical cycle is about 2½ times longer in duration than the average Caribbean growth cycle (see Figures I.5 and I.7).** We also find that high-rate phases (of the Caribbean growth cycle) tend to be considerably shorter-lived than classical expansion phases, and low-rate phases tend to be longer-lived than classical contraction phases. For most Caribbean countries, the duration of classical contraction phases has also varied more about its mean than has the duration of low-rate phases of the growth cycle. In addition, the speed of change of Caribbean growth-cycle phases is typically faster for low-rate phases than for high-rate phases.

26. **This asymmetry in cycle duration can be more clearly seen in Figure I.5, which orders the ten countries by the (decreasing) duration of output expansions.** The duration of the phases varies quite dramatically across the ten countries, ranging from an average expansion of 20 years for St. Lucia to an average expansion of just over 4 years for the United States. The ECCU average duration of expansions (contractions) is about 12 years. Similarly, the amplitude (percent change) measure shows that the average ECCU output decline during contractions is in most cases considerably smaller than the average ECCU output rise during expansions. This differing amplitude can be seen in Figure I.6, which orders the countries by the (decreasing) amplitude of expansions. The average output decline across all six Caribbean countries is about 3 percent during contractions, while the average output rise across all six Caribbean countries is about 42 percent during expansions. This differing relative amplitude results in a large overall upward trend in real output, and indicates that existing trends are caused by the differing relative amplitude of expansions and contractions.

27. **The results in Figure I.7 also imply that an important stylized fact that Caribbean growth cycles share with developed country growth cycles is that they are rather symmetric—positive deviations from trend output are of similar duration to negative deviations from trend output.** Figures I.7 and I.8 present the duration and amplitude of high-rate and low-rate phases, again ordered by the decreasing duration and amplitude of high-rate phases, respectively. For the six Caribbean countries, the average duration of rises in trend-adjusted output in high-rate phases of growth cycles (about 2¾ years) is slightly longer than the average duration of declines in trend-adjusted output in low-rate phases (about 2½ years). Similarly, Figure I.8 reveals that the average rise in trend-adjusted output in high-rate phases of growth cycles (about 5¾ percent) is slightly larger than the average fall in trend-adjusted output in low-rate phases (about 5¼ percent).

28. **The duration of classical and growth cycles in Caribbean output can be compared with those in the existing literature on developed-country and developing-country business cycles.** While the length of the Caribbean classical cycle is longer than earlier findings on the duration of business cycles in developed countries (Backus and Kehoe, 1992), the duration of Caribbean classical cycles is typically much longer than previously measured for developing-country business cycles. The duration of Caribbean classical cycles measured here (at about 12 years) is longer than those derived by Rand and Tarp (2002) using the Bry-Boschan (1971) cycle-dating algorithm and quarterly output data for a range of middle-income developing countries. Rand and Tarp (2002) conclude that developing-country business cycles range in length between about 2 and 5 years; this contrasts with the accepted business cycle duration for the U.S. economy of between 2 and 8 years (Burns and Mitchell 1946). An implication of these results is that classical business cycles in Caribbean countries are much longer-lived than those of other (middle-income) developing countries, and generally slightly longer in duration than those of developed countries.

29. **According to the standard deviations of FD-filtered output, volatility in Caribbean countries is considerably higher than that of developed countries (Table I.3).** Caribbean output volatility ranges from St. Vincent and the Grenadines' low of 30 percent greater than the United States, to St. Lucia's high of over four times greater than that of the United States. On average, Caribbean output volatility is about 2.8 times greater than that of the United States. Using the largest of the ECCU economies (Antigua and Barbuda) as the base, Caribbean output volatility ranges from about half as variable (St. Vincent and the Grenadines) to thirty percent greater in variability (Dominica). In addition, the percentage of the sample period spent in a low-rate phase ranges from a low of 41 percent (Dominica, Grenada and St. Kitts and Nevis) to a high of 63 percent (United Kingdom).[8]

D. Co-movement of Caribbean Business Cycles

Co-movement in Real GDP (Classical Cycles)

30. **We are interested in the question as to whether expansions and contractions in the level of real GDP move together, both among Caribbean countries and between individual Caribbean countries and non-Caribbean countries.** That is, we examine whether the turning points in classical business cycles are similar across countries. To analyze this question we use two measures of co-movement: the correlation of growth rates of real output, and the concordance between real output series.

31. **There is some evidence that the real output series of three of the six Caribbean countries tend to co-move with cycles in Canadian output (Table I.4).** For two of the Caribbean countries (Antigua and Barbuda and Grenada), output appears to co-move with

[8] In contrast, the percentage of time Caribbean countries spent in contraction phase of the classical cycle was much smaller (Antigua and Barbuda 5 percent, Dominica 12, Grenada 7, St. Kitts and Nevis 5, St. Lucia 5, and St. Vincent and the Grenadines 5).

cycles in U.S. output. The results suggest that the level of activity in industrial countries typically has a positive, yet often weak association with Caribbean output. Among the Caribbean islands, co-movement in real output appears strongest between St. Vincent and the Grenadines and St. Lucia, with Antigua and Barbuda and Grenada, Dominica and St. Vincent and the Grenadines, St. Lucia and St. Kitts and Nevis also displaying evidence of synchronized output.

32. **Most previous analyses have used correlation statistics as the measure of co-movement of economic time series.** However, bivariate correlation measures are based on covariance, which is affected by amplitude changes (shifts in the level of the two series) as well as by the fraction of time that any two series are rising together and falling together. It is possible for a large, one-time shift in the level of two series (for example, those induced by the oil shock of 1974) to induce significant correlation in otherwise unrelated series. In contrast, such a shock will only be important under a concordance test to the extent that the co-movement lasts for a lengthy period of time. McDermott and Scott (2000) demonstrate that the covariance of two series may be dominated by the amplitude of a particularly long swing which is common to both series. Accordingly, it may be more relevant to know the degree of synchronization of national business cycles, and so examine the proportion of time that two output series are expanding together and contracting together.

33. **For our purposes, we make use of the concordance statistic originally proposed by Harding and Pagan (2002a).** Concordance is measured by a simple non-parametric statistic that describes the proportion of time two series, x_i and x_j, are in the same phase (Harding and Pagan 2002a, 2002b). Specifically, let $\{ S_{i,t} \}$ be a series taking the value unity when the series x_i (real GDP in country *i*) is in an expansion state, and zero when it is in a contraction state; and let $\{ S_{j,t} \}$ be a series taking the value unity when the series x_j (real GDP in country *j*) is in an expansion state, and zero when it is in a contraction state. The degree of concordance is then

$$C_{ij} = T^{-1}\left\{\sum_{t=1}^{T}\left(S_{i,t}\cdot S_{j,t}\right)+\sum_{t=1}^{T}\left(1-S_{i,t}\right).\left(1-S_{j,t}\right)\right\}, \qquad (1)$$

where S_i and S_j are as defined above, T is the sample size and C_{ij} measure the proportion of time the two series are in the same state. To interpret C_{ij}, a value of say 0.7 for the index indicates that x_i and x_j are in the same phase (that is, expanding or contracting together) 70 percent of the time. The series x_i is exactly pro-cyclical (counter-cyclical) with x_j if $C_{ij} = 1$ ($C_{ij} = 0$).

34. **As a proportion, the values that C_{ij} may take are clearly bounded between zero and one.** Faced with a realized concordance index of, for example, 0.7, it is natural to assume that this is large relative to zero. However, even for two unrelated series the expected value of the concordance index may be 0.5 or higher. For example, consider the case of two fair coins being tossed. The probability that both coins are in the same phase—that is, both heads or both tails—is 0.5.

35. **More generally, a disadvantage of C_{ij} is that it does not provide a means of determining if the extent of co-movement (or synchronization) between cycles in the two series is statistically significant.** To do so we need a concordance test statistic. If the expected value of C_{ij} is evaluated under the assumption of mean independence, then, following Harding and Pagan (2002b), the *t*-statistics examining the null hypothesis of no concordance between the two series can be computed from the regression coefficient estimate attached to $S_{i,t}$ in the regression of $S_{j,t}$ against a constant term and $S_{i,t}$.[9] [10]

36. **The results of the concordance statistic (shown in Table I.5) reveal that the association between real GDP within the ECCU countries and between developed country–ECCU country pairs appears to be very strong.** For example, real output in Canada and Antigua and Barbuda are highly synchronized, moving in the same direction 93 percent of the time. This suggests that real output in these 10 countries spends much of the time in the same phase of the classical cycle. However, the pairwise correlations of phase states are typically rather small (and often negative), which suggests that it is the very high values of the mean value of S_i , rather than a strong correlation between phase states, which underpins the high measured value of concordance (see the bottom row of Table I.5). That is, the fact that most countries spend a very large proportion of the sample in an expansion phase has biased upward the measured value of concordance. This effect is important for Canada, which has a mean value of its phase state indicator of 0.93 and shows concordance with the Caribbean economies in the range of 0.80 to 0.93, yet only shows correlations of phase states with Caribbean economies in the range of -0.10 to 0.37. Once the concordance statistic is mean corrected (which is essentially what occurs when using the correlation of phase states), there is only evidence of significant synchronization of classical cycles (involving rejection of the null hypothesis of no concordance) for the United Kingdom and the United States, which are in the same state of the classical cycle 95 percent of the time. This result highlights the need to use hypothesis testing procedures rather than relying on point estimates of concordance. In summary, evidence for the null hypothesis of no association between the classical cycles of the ten countries is quite strong.

Co-movement in Real GDP Deviations From Trend (Growth Cycles)

37. **Similarly, we may be interested in the question as to whether output deviations from trend move with each other—that is, how synchronized across countries are**

---

[9] In addition, given that the errors from such a regression are unlikely to be *i.i.d.*, due to the strong likelihood of serial correlation or heteroscedasticity in $S_{i,t}$, the *t*-ratio for the regression coefficient has been made robust to higher-order serial correlation and heteroscedasticity. Positive serial correlation in $S_{i,t}$ biases hypothesis tests toward rejecting the null of no concordance (see Harding and Pagan, 2002b).

[10] See also Cashin and McDermott (2002) and Artis et al. (2002) for earlier uses of the concordance statistic to examine co-movement of cycles in economic time series.

output gaps? To analyze this question we follow Scott (2000) and examine the cross-correlation and concordance statistics for filtered output.

38. **The correlation matrix presented in Table I.6 looks at the cross-correlation of FD-filtered output in one country and a similarly-transformed output series for another country.** On this basis, there appears to be strong evidence that filtered output (output gap) series of all but two of the six Caribbean countries tend to co-move with cycles in Canadian filtered output. In contrast, there is no evidence that output gaps in Caribbean countries co-move with either the United States or United Kingdom output gaps. Among the Caribbean islands, co-movement in filtered output appears strongest between St. Lucia and St. Kitts and Nevis, with Antigua and Barbuda and Grenada, and St. Lucia and Grenada also having evidence of synchronized output gaps.

39. **As previously, the concordance statistic is used to examine whether Caribbean economies are above or below potential at the same time or not.** Here the formula for the concordance statistic is as given above in equation (1), with $\{ S_{i,t} \}$ a series taking the value unity when the series x_i (deviation of output from trend in country *i*) is in a high-rate phase, and zero when it is in a low-rate phase; and $\{ S_{j,t} \}$ a series taking the value unity when the series x_j (deviation of output from trend in country *j*) is in a high-rate phase, and zero when it is in a low-rate phase.

40. **The concordance results examining the synchronization of output gaps are given in Table I.7.** There is strong evidence of an association between the growth cycles of Canada and Grenada and Canada and St. Kitts and Nevis, which expand (and contract) together 66 percent of the time. Importantly, while the United States and the United Kingdom have synchronized growth cycles, there is little evidence of synchronization between the growth cycles of the United States and the Caribbean, or the growth cycles of the United Kingdom and the Caribbean. Among the Caribbean islands, evidence of co-movement in growth cycles appears strongest for the pairs Antigua and Barbuda and Dominica, Grenada and St. Kitts and Nevis, and St. Lucia and St. Vincent and the Grenadines. Interestingly, growth cycles in Antigua and Barbuda and St. Vincent and the Grenadines are countercyclical, in that they move together only 34 percent of the time.

Caribbean Links with Industrial Country Business Cycles

41. **In this section we examine further the relationship between output (GDP) fluctuations in each of *j* industrial countries** ($y_{j,t}$) **and output in each of *i* ECCU countries** ($x_{i,t}$). The degree of co-movement of output series is measured by the magnitude of the cross-correlation coefficients at (annual) lag *k*, $\rho(k)$, where $k \in \{0, \pm1, \pm2, \pm3\}$. These correlations (as reported in Table I.8) are between the stationary components of the output series (y_t and x_t), with both components derived using the FD filter. The cross-correlation indexes indicate the shift in time of x_{t+k} (the cycle in Caribbean country output) in comparison with y_t (the cycle in industrial country output). In line with the existing literature, we say that x_t *leads* the industrial output cycle (that is, $x_{i,t+k}$ leads $y_{j,t}$) by *k* periods (years) if $|\rho(k)|$ is maximum for a negative *k*; the Caribbean output cycle is *synchronous* with the

industrial country output cycle (that is, $x_{i,t+k}$ is synchronized with $y_{j,t}$) if $|\rho(k)|$ is maximum for $k = 0$; and the Caribbean output cycle *lags* the industrial country output cycle (that is, $x_{i,t+k}$ lags $y_{j,t}$) by k periods (years) if $|\rho(k)|$ is maximum for a positive k.[11] Possible shifts (leads and lags) in the cyclical movements of each series are identified by how early or late with respect to the contemporaneous period the highest statistically significant correlation occurs.

42. **Business cycle fluctuations in Caribbean countries tend to be correlated with cycles in industrial country output.** As reported in Table I.6, the contemporaneous correlations between industrial country output and Caribbean output are positive for a majority of Caribbean countries. However, there is little evidence of Caribbean output being correlated with either United States or United Kingdom cycles, even when allowing for leads and lags in cycles (Table I.8). German output is positively contemporaneously correlated with Grenada, with some indication that German output appears to have a negative effect on Grenada (and St. Lucia) output with a lag of about two years.

43. **Consistent with the earlier results, the strongest business cycles links are between Canadian output and Caribbean output.** Canadian output appears to have a positive (synchronous) effect on the output of four of the six Caribbean countries at or near lag zero, suggesting that Canadian output fluctuations are transmitted fairly rapidly to Caribbean countries (Table I.8).

44. **Another measure of the co-movement of growth cycles is given by the magnitude of the concordance index at (annual) lag k, $C_{ij}(k)$, where $k \in \{0, \pm1, \pm2, \pm3\}$ and concordance measures the proportion of time that $S_{i,t}$, the phase indicator of series i (deviation of output from trend in country i), and $S_{j,t}$, the phase indicator of series j (deviation of output from trend in country j), move in the same direction.** In particular, the cross-concordance indexes $C_{ij}(k)$ indicate the shift in time of $S_{i,t+k}$ (the growth cycle of country i) in comparison with $S_{j,t}$ (the growth cycle of country j). In line with the results of Table I.7, which examined contemporaneous concordance among country pairs, no significant concordance is found between Caribbean countries and United States or United Kingdom growth cycles, at any lead or lag. There is strong evidence of synchronized (contemporaneous) growth cycles between Canada and St. Kitts and Nevis and Canada and Grenada, and evidence of an association between Canadian growth cycles and the growth cycles of Antigua and Barbuda and St. Lucia (both with a lag of three years). There is also some evidence of an association between German growth cycles and the St. Lucian growth cycle (lagged one year). In summary, the null hypothesis of no association between the Canadian growth cycle and Caribbean growth cycles is strongly rejected for four of the six Caribbean countries—the null is never rejected for the Caribbean-United States and Caribbean-United Kingdom cyclical relationship. Clearly, links between the business cycles

[11] For an earlier study which examines bivariate correlations in detrended macroeconomic time series, see Agénor, McDermott and Prasad (2000).

of Canada and the Caribbean are the strongest among the developed countries examined in this study.[12]

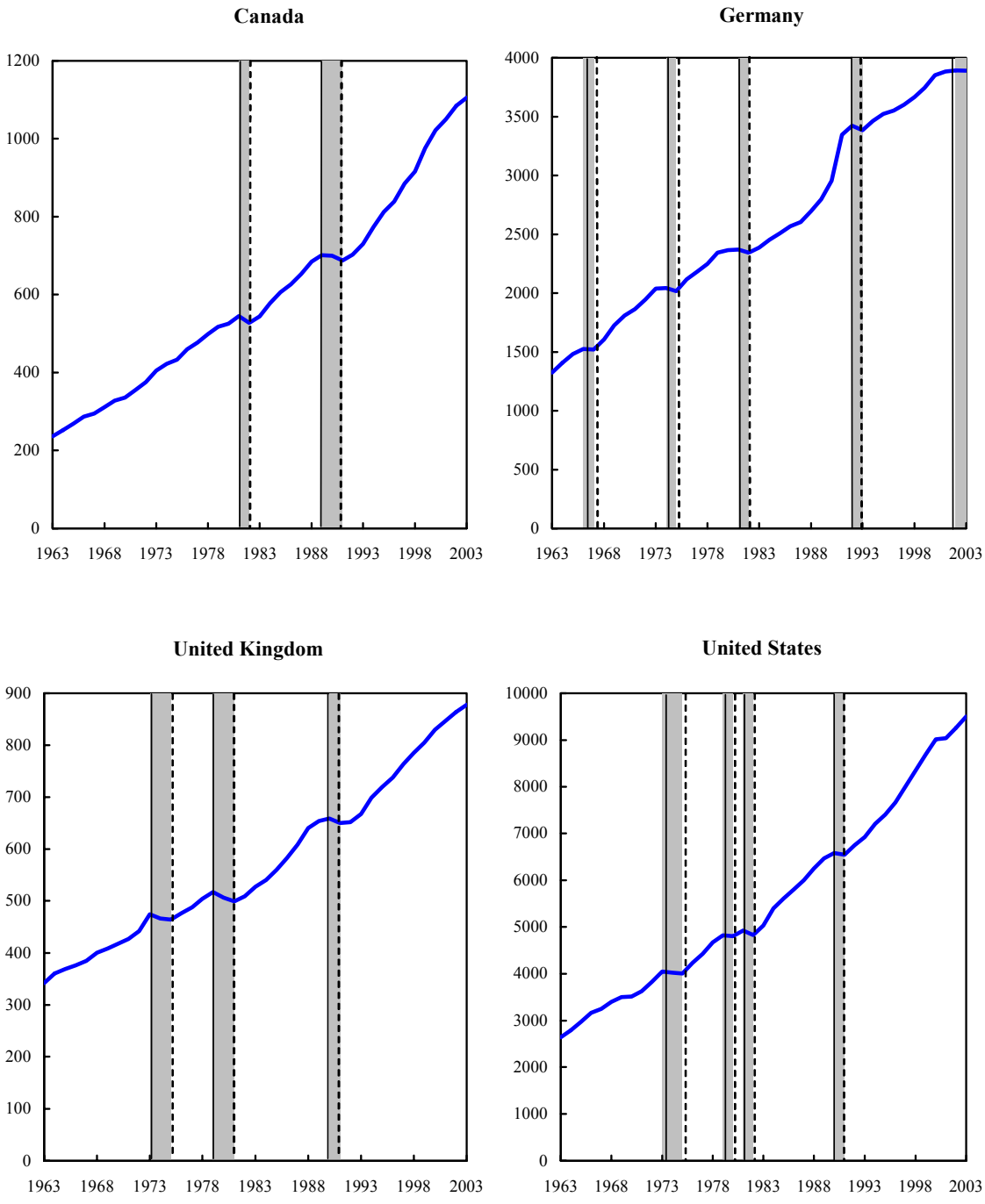
E. Conclusions

45. **This study has examined the key stylized facts of Caribbean business cycles over the period 1963–2003, and calculated a chronology for the classical cycle (involving expansions and contractions in the level of real output) and the growth cycle (involving alternating periods of above- and below-trend economic growth).** In obtaining new measures of classical and growth cycles, simple rules were applied to date turning points in the classical business cycle, and a recently developed frequency domain filter was used to estimate the growth cycle.

46. **In examining the stylized features of Caribbean business cycles, there are several key findings.** First, Caribbean growth cycles are relatively symmetric in both duration and amplitude. This is unlike the Caribbean classical cycle, which typically exhibits long-lived expansions and much shorter-lived contractions, and much greater amplitude of output movement in expansions than contractions. Second, classical business cycles in Caribbean countries are much longer-lived than those of other (middle-income) developing countries, and generally slightly longer in duration than those of developed countries. Third, while movements in the Canadian classical cycle appear to be reasonably synchronized with movements in the classical cycle of Caribbean countries, there is less synchronization of Caribbean movements in real output with those of the United States and the United Kingdom. Fourth, there is little synchronization of Caribbean output deviations from trend (growth cycles) with growth cycles of the United States and the United Kingdom, and quite a deal of (contemporaneous and lagged) co-movement between Canadian and Caribbean growth cycles. Finally, while there is some evidence of synchronization between the classical business cycles of Caribbean countries, there is stronger evidence for synchronization of Caribbean growth cycles.

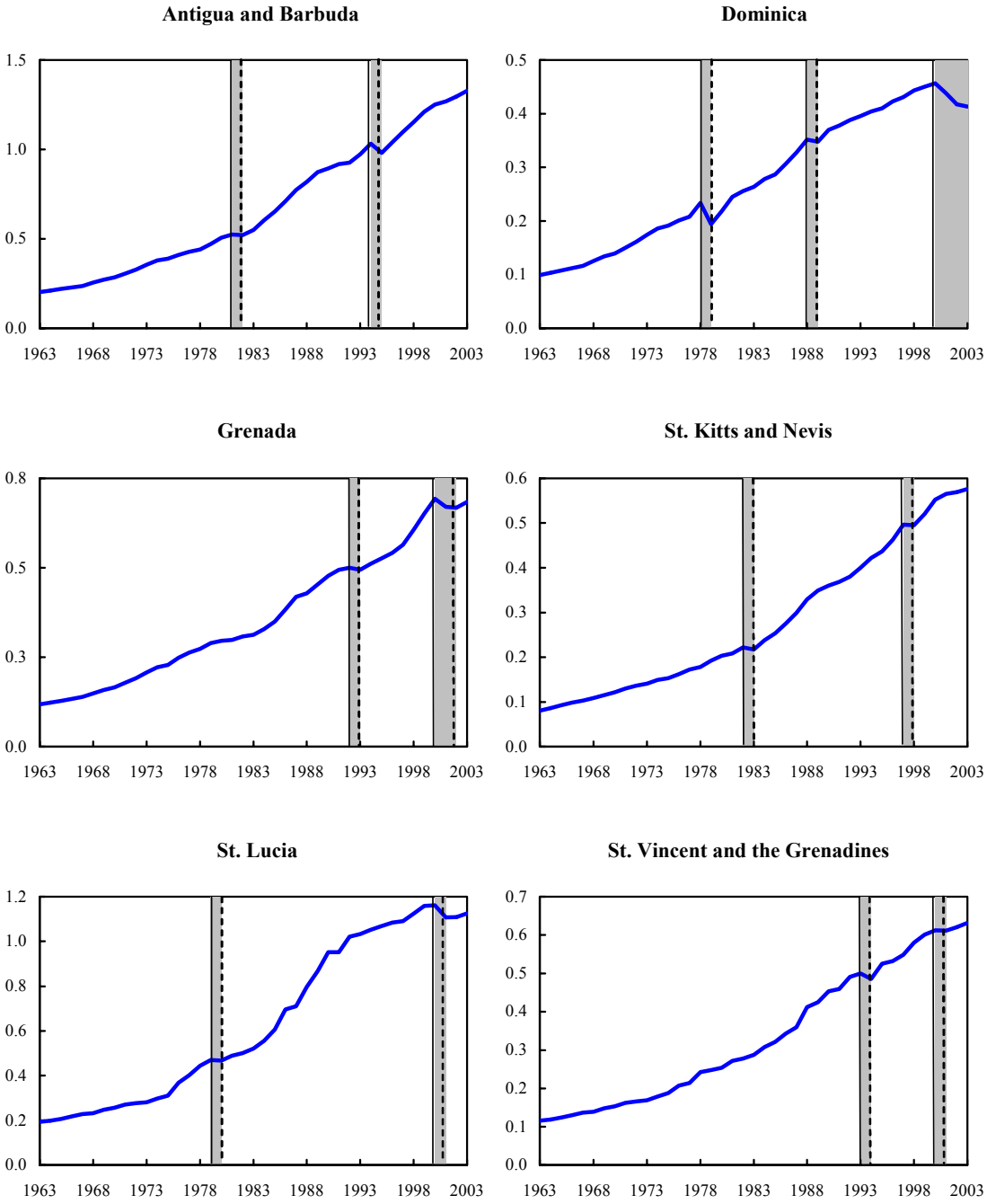
[12] There are several important links between Canada and the countries of the Eastern Caribbean. First, Canada is a major provider of bilateral overseas development assistance flows to the countries of the Eastern Caribbean (OECD 2004). Second, Canadian-licensed banks are active in all ECCU countries. Third, Canada has traditionally been an important emigrant destination for Caribbean nationals, and accounts for a large share of remittance flows into the Caribbean.

Figure I.1. Chronology of Developed-Country Classical Cycles, 1963-2003
(Real GDP in billions of 1995 local currency)



Source: IMF, IFS and WEO; author's calculations.
Notes: Peaks in real GDP are denoted by solid lines; troughs are denoted by dashed lines. Contractions (periods of peak to trough movement) are denoted by shading; expansions (periods of trough to peak movement) are denoted by no shading.

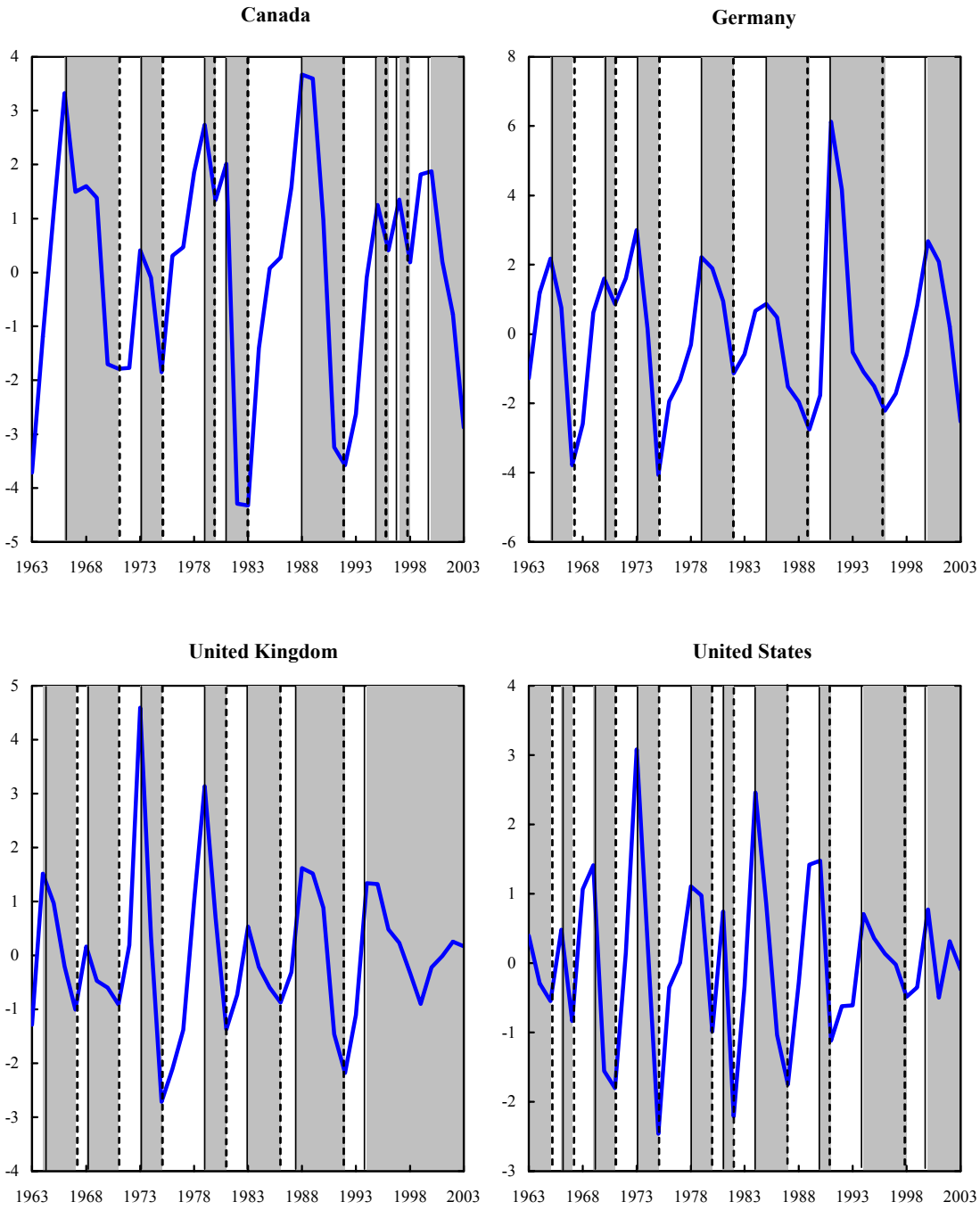
Figure I.2. Chronology of Caribbean Classical Cycles, 1963–2003
(Real GDP in billions of 1990 Eastern Caribbean dollars)



Sources: IMF, IFS and WEO; author's calculations.

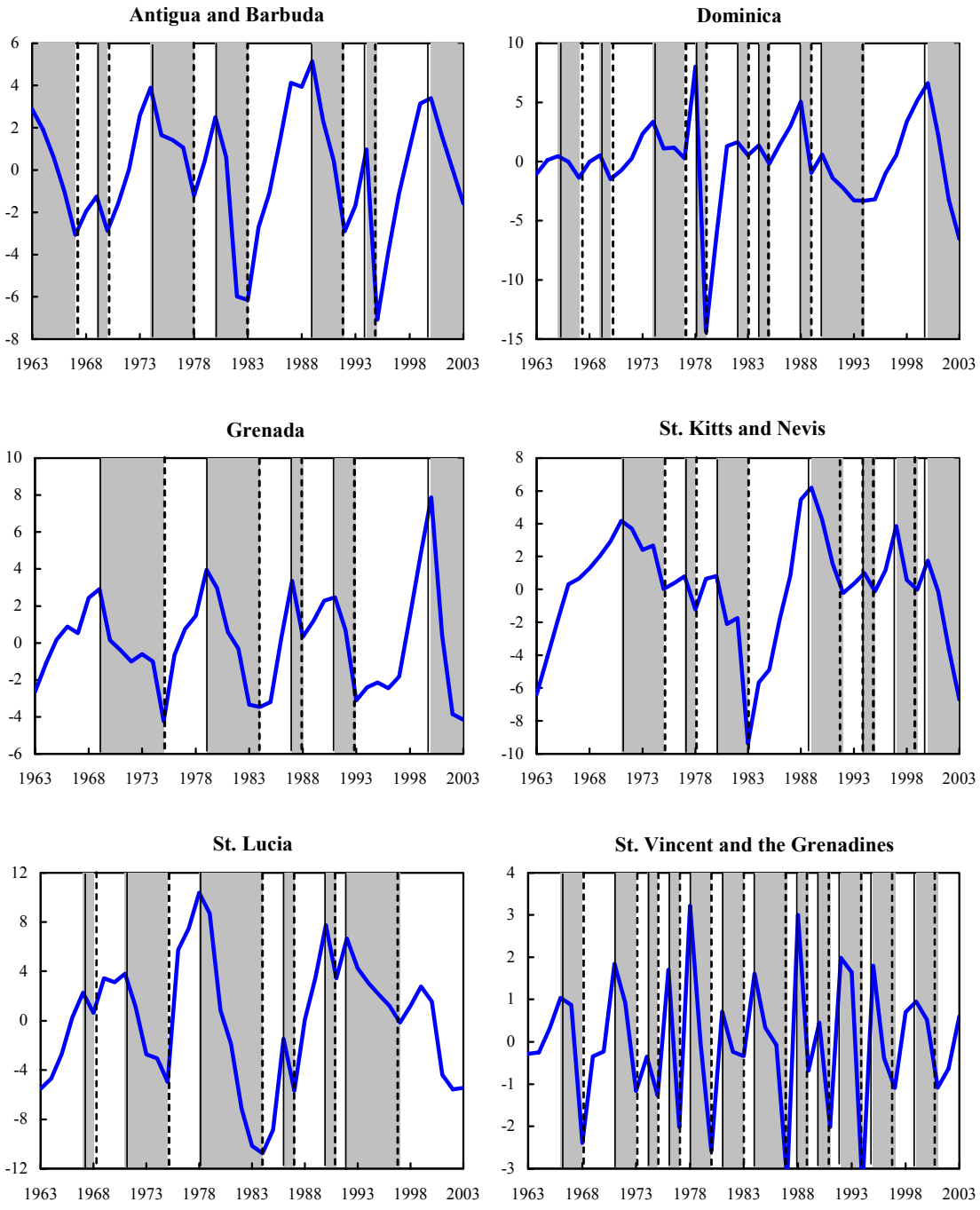
Notes: Peaks in Caribbean real GDP are denoted by solid lines; troughs are denoted by dashed lines. Contractions (periods of peak to trough movement) are denoted by shading; expansions (periods of trough to peak movement) are denoted by no shading.

Figure I.3. Chronology of Developed-Country Growth Cycles, FD-filtered output, 1963–2003
(percentage deviation from trend)



Source: Author's calculations.
Notes: FD denotes Corbae-Ouliaris (2003) filtered real GDP. Turning points in filtered real GDP are described as downturns (denoted by solid lines) and upturns (denoted by dashed lines). Low-rate growth phases (periods of downturn to upturn movement) are denoted by shading; high-rate growth phases (periods of upturn to downturn movement) are denoted by no shading.

Figure I.4. Chronology of Caribbean Growth Cycles, FD Filtered Output, 1963-2003
(percentage deviation from trend)



Source: Author's calculations.
Notes: FD denotes Corbae-Ouliaris (2003) filtered real GDP. Turning points in filtered Caribbean real GDP are described as downturns (denoted by solid lines) and upturns (denoted by dashed lines). Low-rate growth phases (periods of downturn to upturn movement) are denoted by shading; high-rate growth phases (periods of upturn to downturn movement) are denoted by no shading.

Figure I.5. Average Duration of Expansions and Contractions in Real GDP, 1963-2003

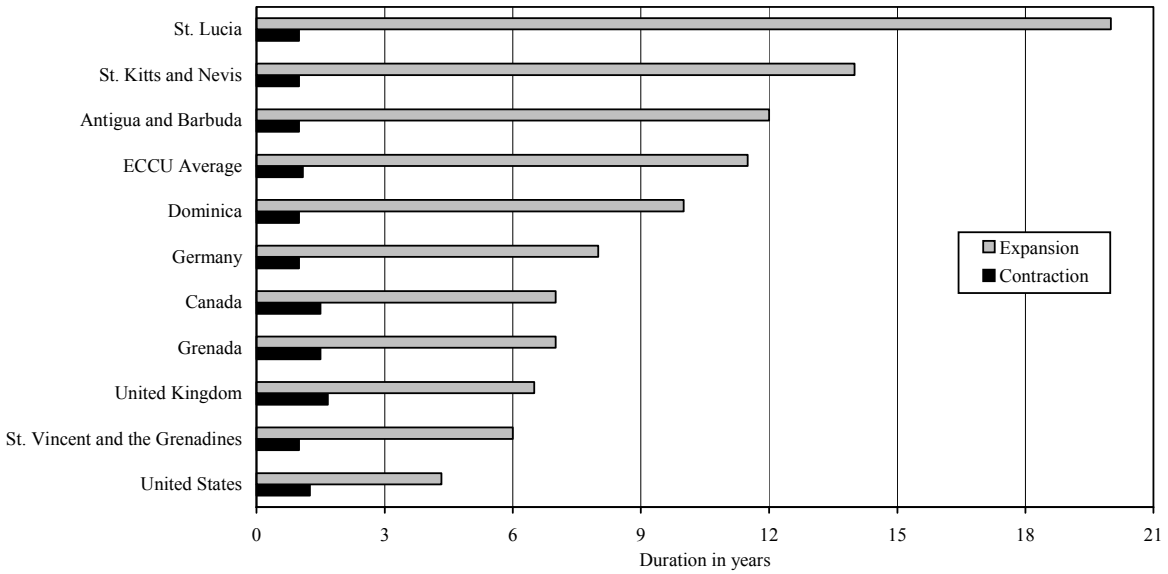
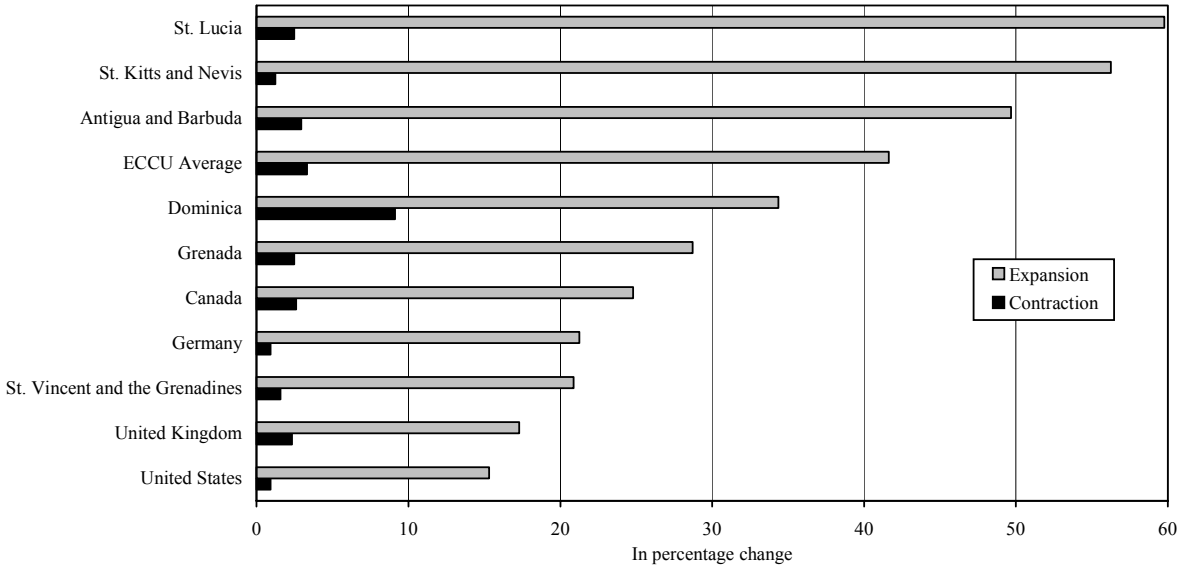


Figure I.6. Average Amplitude of Expansions and Contractions in Real GDP, 1963-2003



Source: Author's calculations.

Figure I.7. Average Duration of Expansions and Contractions in Real GDP Growth, 1963-2003

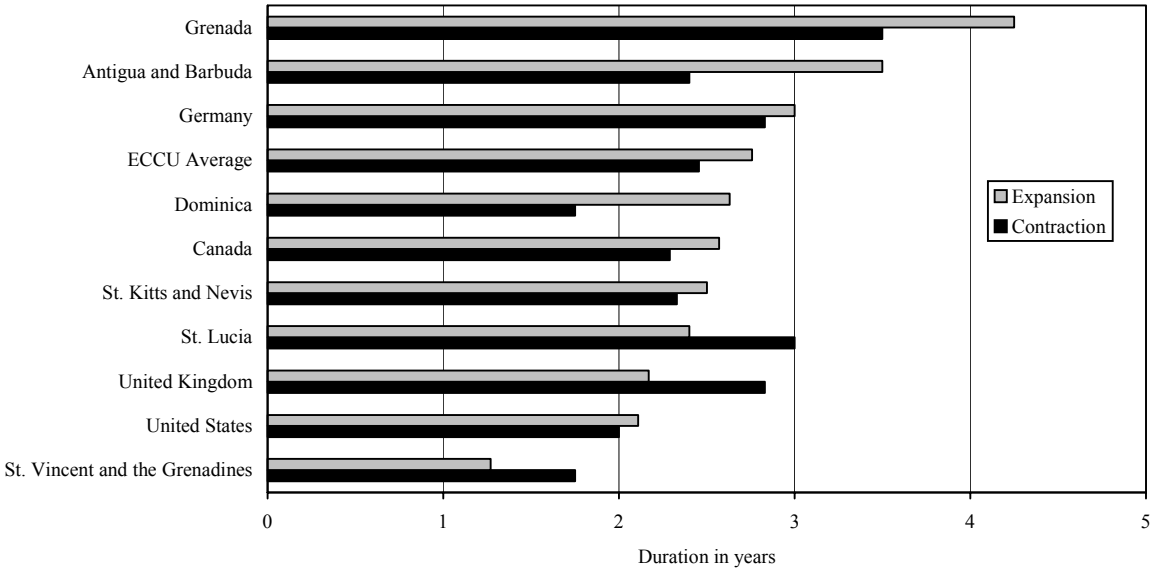
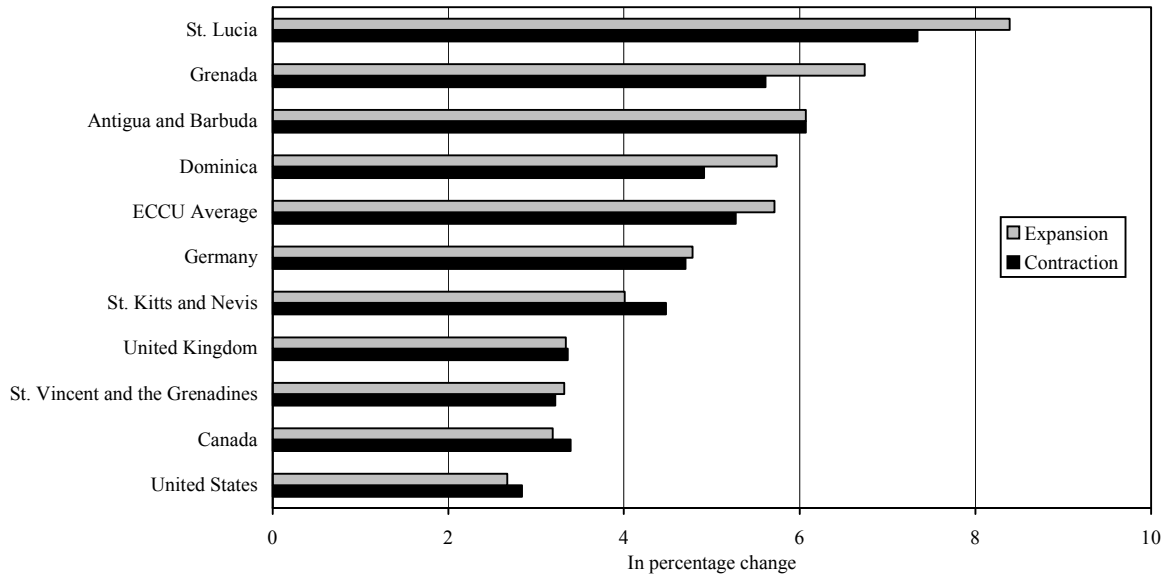


Figure I.8. Average Amplitude of Expansions and Contractions in Real GDP Growth, 1963-2003



Source: Author's calculations.

Table I.1. Properties of Output Growth Rates, 1963–2003

	Mean (Percentage)	Standard Deviation (Percentage)	Coefficient of Variation	Autocorrelation Coefficient (1 yr)	Autocorrelation Coefficient (2 yrs)
Canada (CAN)	3.86	2.21	0.57	0.32	0.1
Germany (GER)	2.7	2.6	0.96	0.33	-0.13
United Kingdom (UNK)	2.36	1.9	0.81	0.29	-0.19
United States of America (USA)	3.2	2.1	0.66	0.22	-0.19
Antigua and Barbuda (ATG)	4.7	2.79	0.59	0.23	0.01
Dominica (DMA)	3.54	5.11	1.44	-0.11	0.07
Grenada (GRD)	4.38	2.88	0.66	0.43	0.08
St Kitts and Nevis (KNA)	4.91	2.42	0.49	0.12	0.15
St Lucia (LCA)	4.41	4.21	0.95	0.38	0.32
St Vincent and the Grenadines (VCT)	4.25	3.14	0.74	-0.14	0.23

Sources: Author's calculations.

Notes: Sample moments were computed from log-differences of real output. Coefficient of variation is the ratio of the standard deviation to the arithmetic mean. Autocorrelations of one and two years are the first- and second-order autocorrelation coefficients, respectively.

Table I.2. Summary Statistics for Filtered Output, 1963–2003

	HP Standard Deviation	HP Skewness	HP Kurtosis	FD Standard Deviation	FD Skewness	FD Kurtosis	FD Business Cycle Frequency (Years)
CAN	2.18	-0.53	-0.06	2.14	-0.42	-0.55	[2, 9]
GER	2.58	0.71	0.91	2.13	0.47	0.49	[2, 9]
UNK	2.03	0.42	0.64	1.38	0.91	2.22	[2, 8]
USA	2.04	-0.42	-0.22	1.16	0.22	0.54	[2, 6]
ATG	2.81	-0.45	0.47	2.88	-0.55	0.04	[2, 13]
DMA	3.66	-1.2	4.9	3.75	-1.22	4.82	[2, 11]
GRD	3.28	0.15	-0.65	2.64	0.55	0.62	[2, 9]
KNA	2.26	-0.4	2.5	3.34	-0.76	0.75	[2, 15]
LCA	3.99	-0.04	-0.11	5.14	-0.18	-0.46	[2, 20]
VCT	2.55	0.3	-0.4	1.53	-0.25	0.08	[2, 7]

Sources: Author's calculations.

Notes: HP denotes the Hodrick–Prescott (1980) filtered output (with smoothing parameter λ=100); FD denotes the Corbae–Ouliaris (2003) filtered output. The business cycle frequencies used to derive FD-filtered output are given in the last column of the table, and were determined using the rule set out in Section B—for annual data, minimum cycle length is 2 years while the upper bound on cycle length is the average duration of each country's classical business cycle. The skewness measure is $\mu_3/(\mu_2)^{1.5}$ and the kurtosis measure is $\mu_4/(\mu_2)^2 - 3$, where μ_r is the rth (central) moment. The skewness of a symmetrical distribution, such as the normal, is zero; similarly, the kurtosis (as previously defined) of the normal distribution is zero.

Table I.3 Features of Growth Cycles, FD-Filtered Real GDP, 1963–2003

	CAN	GER	UNK	USA	ATG	DMA	GRD	KNA	LCA	VCT
Number of downturns	7	6	6	8	5	8	4	6	6	12
Number of upturns	7	6	6	9	6	8	4	6	5	11
Time spent in low-rate phase (percent)	46	49	63	54	49	41	41	41	44	51
Average duration of high-rate phase (years)	2.57	3	2.17	2.11	3.5	2.63	4.25	2.5	2.4	1.27
Average duration of low-rate phase (years)	2.29	2.83	2.83	2	2.4	1.75	3.5	2.33	3	1.75
Average amplitude of high-rate phase (percent change)	3.19	4.78	3.34	2.67	6.07	5.74	6.74	4.01	8.39	3.32
Average amplitude of low-rate phase (percent change)	-3.39	-4.7	-3.36	-2.84	-6.07	-4.91	-5.61	-4.48	-7.34	-3.22
Volatility (standard deviation of growth cycle)	2.14	2.13	1.38	1.62	2.88	3.75	2.64	3.34	5.14	1.53
Ratio of volatility to USA volatility	1.84	1.84	1.19	1	2.48	3.23	2.27	2.87	4.42	1.32
Ratio of volatility to ATG volatility	0.74	0.74	0.48	0.4	1	1.3	0.92	1.16	1.79	0.53

Sources: Author's calculations.

Notes: FD denotes the Corbae–Ouliaris (2003) filtered GDP series.

Table I.4. Correlation Statistics: Annual Log Changes in Real GDP

	CAN	GER	UNK	USA	ATG	DMA	GRD	KNA	LCA	VCT
CAN	1	0.07	**0.53***	**0.78***	**0.40***	0.11	**0.34***	**0.31***	0.12	0.14
GER		1	0.12	0.22	0.15	0.05	**0.36***	0.11	0.16	0.04
UNK			1	**0.63***	0.26	-0.05	**0.32***	0.27	0.08	-0.02
USA				1	**0.37***	0.09	**0.35***	0.25	0.3	0.2
ATG					1	0.18	**0.51***	**0.45***	0.21	-0.1
DMA						1	0.24	0.11	0.21	**0.38***
GRD							1	**0.40***	**0.44***	0.2
KNA								1	**0.33***	0.2
LCA									1	**0.72***
VCT										1

Source: Author's calculations.

Notes: Each series is the correlation between bivariate pairs of the first difference of the logarithm of real GDP. The 5 percent critical value for significant correlations is calculated as $1.96/T^{½}$, where T is the number of observations. Accordingly, for the period 1963–2003, T=40, then individual cross-correlations exceeding (in absolute value) 0.309 will be significant at the 5 percent level.

Table I.5. Concordance Statistics: Log of Real GDP

	CAN	GER	UNK	USA	ATG	DMA	GRD	KNA	LCA	VCT
CAN		0.85	0.85	0.9	0.93	0.8	0.85	0.88	0.88	0.88
GER	0.18		0.8	0.85	0.88	0.8	0.85	0.83	0.83	0.83
UNK	0.18	0.09		**0.95***	0.83	0.76	0.8	0.83	0.88	0.83
USA	0.47	0.32	**0.77***		0.88	0.76	0.8	0.83	0.88	0.83
ATG	0.37	0.26	-0.08	0.26		0.83	0.88	0.9	0.9	0.9
DMA	-0.1	0.09	-0.14	-0.14	-0.08		0.9	0.83	0.88	0.88
GRD	-0.08	0.18	-0.1	-0.1	-0.06	0.47		0.88	0.93	0.93
KNA	-0.06	-0.08	-0.08	-0.08	-0.05	-0.08	-0.06		0.9	0.9
LCA	-0.06	-0.08	0.26	0.26	-0.05	0.26	0.37	-0.05		0.95
VCT	-0.06	-0.08	-0.08	-0.08	-0.05	0.26	0.37	-0.05	0.47	
Mean S_i	0.93	0.88	0.88	0.88	0.95	0.88	0.93	0.95	0.95	0.95

Source: Author's calculations.

Notes: Concordance measures the extent to which the cycles in two series are synchronized, and is the proportion of time that real output (the classical cycle) of two countries are concurrently in the same phase (that is, concurrently in an expansion period or concurrently in a contraction period). The concordance statistic C_{ij} is above the diagonal, while the correlation statistic is below the diagonal and the mean value of S_i is in the bottom row of the table. Following Harding and Pagan (2002b), the t-statistics testing the null of no association were computed from the least squares regression of $S_{j,t} = a + bS_{i,t} + u_t$, where: a is a constant term, u_t is the error term, $S_{i,t}$ is a series taking the value unity when real output in the i th country is in an expansion phase and zero when real output in the i th country is in a contraction phase, and $S_{j,t}$ is a series similarly defined for real output of the j th country. The t-statistic tests the null hypothesis of no synchronization (that is, H_0: b=0 in the above regression) between series $S_{i,t}$ and series $S_{j,t}$, and the t-statistics were computed using the White heteroskedastic autocorrelated consistent standard errors. The bolded cell (with an asterisk) indicates significance at the 5 percent level.

Table I.6. Correlation Statistics: Filtered Real GDP (Output Gap)

	CAN	GER	UNK	USA	ATG	DMA	GRD	KNA	LCA	VCT
CAN	1.00	-0.16	**0.38***	**0.37***	**0.41***	0.14	**0.51***	**0.49***	**0.36***	0.03
GER		1.00	0.1	0.08	0.08	-0.06	**0.35***	-0.01	0.08	0.01
UNK			1.00	**0.56***	0.13	-0.18	0.07	0.16	0.02	-0.09
USA				1.00	0.12	0.02	0.05	-0.01	0.07	0.1
ATG					1.00	0.24	**0.38***	**0.35***	0.09	-0.24
DMA						1.00	0.2	0.12	-0.12	0.22
GRD							1.00	**0.45***	**0.49***	-0.08
KNA								1.00	**0.62***	-0.05
LCA									1.00	0.2
VCT										1.00

Source: Author's calculations.

Notes: Each series is the correlation between bivariate pairs of FD-filtered output (in percent). The 5 percent critical value for significant correlations is calculated as $1.96/T^{½}$, where T is the number of observations. Accordingly, for the period 1963–2003, T=40, then individual cross-correlations exceeding (in absolute value) 0.309 will be significant at the 5 percent level. The bolded cell (with an asterisk) indicates significance at the 5 percent level.

Table I.7. Concordance Statistics: Filtered Real GDP (Output Gap)

	CAN	GER	UNK	USA	ATG	DMA	GRD	KNA	LCA	VCT
CAN		0.63	**0.68***	0.63	0.59	0.61	**0.66***	**0.66***	0.49	0.51
GER	0.27		0.61	0.61	0.51	0.59	**0.68***	0.54	0.56	0.54
UNK	**0.40***	0.23		**0.66***	0.51	0.49	0.49	0.54	0.37	0.39
USA	0.28	0.22	**0.31***		0.56	0.49	0.49	0.49	0.51	0.54
ATG	0.17	0.02	0.03	0.12		**0.68***	0.54	**0.68***	0.37	**0.34***
DMA	0.21	0.17	0.02	-0.01	**0.37***		0.56	0.51	0.44	0.61
GRD	**0.31***	**0.37***	0.02	-0.01	0.04	0.1		**0.71***	0.63	0.46
KNA	**0.31***	0.07	0.12	-0.01	**0.37***	-0.01	**0.40***		0.59	0.41
LCA	-0.03	0.12	-0.24	0.03	-0.27	-0.15	0.25	0.15		**0.73***
VCT	0.03	0.07	-0.23	0.07	**-0.31***	0.23	-0.07	-0.17	**0.47***	
Mean S_i	0.54	0.51	0.37	0.46	0.51	0.59	0.59	0.59	0.56	0.49

Source: Author's calculations.

Notes: Concordance measures the extent to which the cycles in two series are synchronized, and is the proportion of time that the deviation of output from trend (filtered output or the growth cycle) of two countries are concurrently in the same phase (that is, concurrently in a high-rate growth period or concurrently in a low-rate growth period). The concordance statistic C_{ij} is above the diagonal, while the correlation statistic is below the diagonal and the mean value of S_i is in the bottom row of the table. Following Harding and Pagan (2002b), the t-statistics testing the null of no association were computed from the least squares regression of $S_{j,t} = a + bS_{i,t} + u_t$, where: a is a constant term, u_t is the error term, $S_{i,t}$ is a series taking the value unity when the growth cycle in the i th country is in a high-rate phase and zero when the growth cycle in the i th country is in a low-rate phase, and $S_{j,t}$ is a series similarly defined for the growth cycle of the j th country. The t-statistic tests the null hypothesis of no synchronization (that is, H_0: b =0 in the above regression) between series $S_{i,t}$ and series $S_{j,t}$, and the t-statistics were computed using the White heteroskedastic autocorrelated consistent standard errors. The bolded cell (with an asterisk) indicates significance at the 5 percent level.

Table I.8. Comovement of Developed Country Output and ECCU Output

	k(-3)	k(-2)	k(-1)	k(0)	k(1)	k(2)	k(3)
	Cross-Correlation of United States Output (at time t) with						
Output of Country (at time $t+k$)							
Antigua and Barbuda	0.05	-0.20	-0.11	0.12	0.04	-0.01	0.01
Dominica	0.23	-0.01	0.06	0.02	-0.17	-0.08	-0.05
Grenada	0.01	-0.02	-0.11	0.05	0.05	-0.01	0.03
St. Kitts and Nevis	-0.02	0.06	-0.02	-0.01	0.03	-0.10	0.04
St. Lucia	-0.03	0.07	-0.01	0.07	-0.05	-0.06	-0.02
St. Vincent and the Grenadines	-0.04	0.26	0.06	0.10	-0.23	-0.15	0.13
	Cross-Correlation of United Kingdom Output (at time t) with						
Output of Country (at time $t+k$)							
Antigua and Barbuda	-0.10	-0.10	-0.01	0.13	0.19	0.04	-0.07
Dominica	-0.10	0.07	0.06	-0.17	-0.19	0.03	0.18
Grenada	0.01	-0.01	-0.04	0.07	0.04	-0.06	0.04
St. Kitts and Nevis	-0.11	-0.03	0.03	0.16	0.16	0.05	-0.04
St. Lucia	0.07	0.19	0.11	0.02	-0.13	-0.17	-0.04
St. Vincent and the Grenadines	-0.09	0.22	0.15	-0.09	-0.15	-0.04	0.01
	Cross-Correlation of Canadian Output (at time t) with						
Output of Country (at time $t+k$)							
Antigua and Barbuda	-0.19	-0.05	0.27	**0.41***	0.25	0.05	-0.08
Dominica	0.23	0.04	0.10	0.15	0.02	0.00	-0.08
Grenada	**-0.51***	-0.20	0.16	**0.51***	**0.52***	**0.38***	0.21
St. Kitts and Nevis	**-0.44***	-0.22	0.11	**0.49***	**0.48***	0.19	0.01
St. Lucia	**-0.29***	-0.05	0.11	**0.36***	**0.31***	0.20	0.08
St. Vincent and the Grenadines	0.03	0.17	-0.01	0.03	-0.16	-0.15	0.08
	Cross-Correlation of German Output (at time t) with						
Output of Country (at time $t+k$)							
Antigua and Barbuda	-0.02	0.01	0.06	0.08	-0.03	-0.04	-0.12
Dominica	0.13	-0.01	0.01	-0.06	-0.13	-0.12	-0.11
Grenada	0.04	0.19	**0.37***	**0.35***	-0.11	**-0.45***	**-0.40***
St. Kitts and Nevis	0.29	0.14	-0.01	-0.01	-0.11	-0.18	-0.17
St. Lucia	0.20	0.33	0.24	0.08	-0.17	**-0.34***	**-0.34***
St. Vincent and the Grenadines	0.14	0.12	0.02	0.01	0.12	-0.04	-0.29

Source: Author's calculations.

Notes: Each series is the correlation between bivariate pairs of FD-filtered output (in percent). Entries are cross-correlation coefficients, calculated as set out in Section D. The central column displays the contemporaneous cross-correlations. Columns on the left (right) are correlations between the contemporaneous growth cycle of industrial country output ($y_{j,t}$) and the growth cycle in each of the ECCU countries ($x_{i,t+k}$) shifted backward (forward) by one, two and three years. Lag k indicates the correlation between contemporaneous values of the growth cycle of a developed country and the kth lag of the growth cycle of an ECCU country, where $k<0$ ($k>0$) denotes a lead (lag).

The 5 percent critical value for significant correlations is calculated as $1.96/T^{½}$, where T is the number of observations. Accordingly, for the period 1963–2003, $T=40$, then individual cross-correlations exceeding (in absolute value) 0.309 will be significant at the 5 percent level.
A bolded cell (with an asterisk) indicates significance at the five percent level.

References

Agénor, P-R., C. J. McDermott, and E. Prasad, 2000, "Macroeconomic Fluctuations in Developing Countries: Some Stylized Facts," *World Bank Economic Review*, Vol. 14, pp. 251–85.

Artis, M., M. Marcellino, and T. Proietti, 2002, "Dating the Euro Area Business Cycle," (unpublished, *European University Institute*, Florence).

Backus, D., and P. Kehoe, 1992, "International Evidence on the Historical Properties of Business Cycles," *American Economic Review*, Vol. 82, pp. 864–88.

Baxter, M., and R. King, 1999, "Measuring Business Cycles: Approximate Band-Pass Filters for Economic Time Series," *Review of Economics and Statistics,* Vol. 81, pp. 575–93.

Borda, P., O. Manioc, and J. G. Montauban, 2000, "The Contribution of U.S. Monetary Policy to Caribbean Business Cycles," *Social and Economic Studies*, Vol. 49, pp. 225–50.

Bry, G., and C. Boschan, 1971, "*Cyclical Analysis of Time Series: Selected Procedures and Computer Programs*," National Bureau of Economic Research, New York.

Burns, A., and W. Mitchell, 1946, "*Measuring Business Cycles*," National Bureau of Economic Research, New York.

Canova, F., 1998, "Detrending and Business Cycle Facts," *Journal of Monetary Economics,* Vol. 41, pp. 475–512.

Cashin, P., and C. J. McDermott, 2002, "Riding on the Sheep's Back: Examining Australia's Dependence on Wool Exports," *Economic Record*, Vol. 78, pp. 249–263.

Cashin, P., and S. Ouliaris, 2004, "Key Features of Australian Business Cycles," *Australian Economic Papers*, Vol. 43, pp. 39–58.

Corbae, P. D., and S. Ouliaris, 2003, "Extracting Cycles from Non-Stationary Data," in *Econometric Theory and Practice: Frontiers of Analysis and Applied Research, Essays in Honor of Peter C. B. Phillips*, edited by P. Dean Corbae, Bruce Hansen, and Stephen Durlauf (forthcoming).

Craigwell, R., and A. Maurin, 2002, "Production and Unemployment Cycles in the Caribbean: The Case of Barbados and Trinidad and Tobago," (unpublished, Research Department, Central Bank of Barbados).

De Masi, P., 1997, "IMF Estimates of Potential Output: Theory and Practice," *Staff Studies for the World Economic Outlook*, International Monetary Fund: Washington DC, pp. 40-46.

Harding, D., and A. Pagan, 2002a, "Dissecting the Cycle: A Methodological Investigation," *Journal of Monetary Economics*, Vol. 49, pp. 365–81.

_____, 2002b, "Synchronisation of Cycles," (unpublished, University of Melbourne) (http://wff2.ecom.unimelb.edu.au/iaesrwww/people/dharding/synchje.pdf).

Hodrick, R. J., and E. C. Prescott, 1980, "Post-War U.S. Business Cycles: An Empirical Investigation," Discussion Paper No. 451 (Carnegie-Mellon University, Pennsylvania).

Lucas, R. E., 1977, "Understanding Business Cycles," *Carnegie-Rochester Conference Series on Public Policy,* Vol. 5, pp. 7–29.

McDermott, C. J., and A. Scott, 2000, Concordance in Business Cycles. IMF Working Paper WP/00/37, (Washington, DC: International Monetary Fund).

Mamingi, N., 1999, "Testing for Convergence and Common Features in International Output: The Case of the Eastern Caribbean Countries," *Journal of Eastern Caribbean Studies*, Vol. 24, pp. 15–40.

Mendoza, E., 1995, "The Terms of Trade, the Real Exchange Rate, and Economic Fluctuations," *International Economic Review*, Vol. 36, pp. 101–37.

Mintz, I., 1972, "Dating American Growth Cycles," in *The Business Cycle Today*, edited by Victor Zarnowitz, National Bureau of Economic Research, New York, pp. 39–88.

Organization for Economic Co-Operation and Development, 2004, *International Development Statistics 2004*, OECD, Paris.

Rand, J., and F. Tarp, 2002, "Business Cycles in Developing Countries: Are They Different?," *World Development*, Vol. 30, pp. 2071–88.

Scott, A., 2000, "Stylised Facts from Output Gap Measures," Discussion Paper 2000/07, Reserve Bank of New Zealand, Wellington.

Watson, M. W., 1994, "Business Cycle Durations and Postwar Stabilization of the U.S. Economy," *American Economic Review,* Vol. 84, pp. 24–46.

II. Natural Disasters and their Macroeconomic Implications[1]

A. Introduction

1. **Natural disasters have a substantial macroeconomic impact in many developing countries.**[2] Tropical cyclones, floods, droughts, and other natural hazards may overwhelm countries' resources and have disastrous outcomes. With little resilience to such events, developing countries are particularly vulnerable and have borne most of the disaster-related human cost. Within countries, the poor suffer most, as limited access to capital markets and insurance entail few possibilities for smoothing out losses. Large natural disasters have often led to a worsening of fiscal and external balances, and have sometimes triggered economic crises. Extreme weather events are becoming more frequent, which highlights the need for polices to better mitigate and respond to these occurrences.

2. **The ECCU countries stand out as among the most hazard prone in the world, with a very high frequency of violent windstorms.** A direct hit by a major hurricane, causing massive human suffering and widespread destruction, is almost certain to occur again in the future. Based on the experience since 1970, a large natural disaster, inflicting damage equivalent to more than 2 percent of the affected country's GDP, can be expected to hit the region roughly once every two and a half years.

3. **The high public debt levels in ECCU countries severely constrain their financial ability to respond to adverse shocks, making preparedness for natural disaster**

---

[1] Prepared by Tobias Rasmussen.

[2] The main source of data on natural disasters used in this paper is the EM-DAT database compiled by the Centre for Research on the Epidemiology of Disasters (CRED, 2003). Natural disasters are here defined as events due to natural causes that caused 10 or more fatalities, affected 100 or more people, or resulted in a call for international assistance or the declaration of a state of emergency. This database contains information on 8,815 natural disasters from 1900–2002, including estimates of the number of people affected and the value of damage. The total number of affected is defined as people that have been injured, made homeless, or requiring immediate assistance during a period of emergency. Estimates of the number affected are available in only about two thirds of cases and are subject to significant uncertainty. The figures for estimated damage are available in only about one third of cases and are even more questionable, with CRED figures coming from a number of different sources using different methodologies. The data should therefore be interpreted with caution. Note also that windstorms and other natural events may have substantial implications even if they do not meet the EM-DAT definition of a natural disaster. In the ECCU, for example, even relatively minor tropical storms have often had large impacts on agricultural output. Despite the wealth of information, the EM-DAT data still suffers from under-reporting, especially in the earlier periods, and the analysis consequently focuses on the period since 1970.

all the more important. Countries can substantially lessen their exposure by improving building practices and better response strategies can help reduce the severity of disasters. Nevertheless, natural disasters cannot be entirely avoided. This calls for generating public savings in good times to leave room for added expenditure when natural disasters occur. Increased use of market-insurance to address natural hazard risk would help, but there is also a need for increased self-insurance through the creation of contingency funds. However, given the high levels of debt and the fiscal problems in many countries, freeing resources to combat natural disasters is becoming increasingly difficult.

4. **The remainder of this chapter is organized as follows.** Section B presents an overview of the incidence of natural disasters, while Section C discusses their macroeconomic implications. Section D offers an outline of different strategies to mitigate the impact of natural disasters, and Section E summarizes the key findings.

B. The Incidence of Natural Disasters

5. **Of the more than 6,000 natural disasters recorded since 1970, three-fourths of the events and 99 percent of the people affected were in developing countries.** During 1970–2002, natural disasters are estimated to have affected more than five billion people and to have caused more than a trillion dollars in damage (Table II.1, Figure II.1, Figure II.2). About 40 percent of the damage occurred in developing countries, almost double their share in world GDP. The poor are often the primary victims of natural disasters, as they tend to live in high-risk areas, rely on a fragile low quality infrastructure, and engage in agriculture, which is particularly exposed to weather-related events (World Bank, 2003).

6. **Natural disasters are becoming more frequent and the overall cost is increasing even more rapidly.** The total number of natural disasters recorded in the 1990s increased threefold compared to the 1970s, and estimated economic losses increased even more rapidly. These increases are partly the result of a build-up of infrastructure subject to potential damage, and an increased concentration of population in high-risk areas. While part of the higher number of recorded natural disasters is related to more comprehensive reporting, there is also a broad consensus that the frequency and intensity of extreme weather events have gone up and are likely to increase further during the twenty-first century (IPCC, 2001). This development is generally thought to be associated with the increase in mean global surface temperatures, which has lead to higher absorption of water vapor into the atmosphere.

7. **Overall, the number of people affected by natural disasters appears to be growing at a somewhat slower pace than the economic damage.** Indeed, in a majority of countries, the share of the population affected by natural disasters declined from the 1980s to the 1990s. As countries have become richer their capacity to withstand and respond to natural hazards appears to have improved. This likely reflects an increased institutional capacity, quality improvements in the housing stock and other relevant infrastructure, and a movement away from agriculture.

8. **The negative impact of higher income on vulnerability to natural disasters is evident in cross-country regression analysis**. Regressing the number of people affected by

natural disasters on measures of the frequency of events, income, and the share of employment in agriculture produces coefficients with the expected signs, although the coefficient on agriculture is only just significant at the 10 percent level (Table II.2). Economic damage from natural disasters appears less strongly influenced by income levels, which presumably reflects that increased wealth also entails more assets subject to potential damage, and the role of agriculture in this case appears insignificant.[3]

9. **Situated in the so-called hurricane alley, the ECCU countries are highly exposed to natural disasters.** The Eastern Caribbean is in the center of the Atlantic hurricane belt, and several of the countries are subject to potential volcanic eruptions. Typically occurring during the June–November period, windstorms have caused 34 of the 44 natural disasters recorded since 1970 in the six ECCU countries that are Fund members (Table II.3). On average, a natural disaster occurred once every four and a half years in each of the six countries. Not all these events were very large, however. Considering only incidents that affected at least 2 percent of a country's population or inflicted damage of at least 2 percent of GDP, EM-DAT figures point to such events occurring in the individual countries once every nine years or somewhere in the region once every two and a half years. Among these large disasters, the median number of affected amounted to 9 percent of the country's population and the median value of damage was equivalent to 14 percent of the country's annual GDP.

10. **Some events have been truly devastating, affecting the population of an entire country and causing damage exceeding 100 percent of GDP.** For example, in 1979 Hurricane David hit Dominica with winds in excess of 130mph, killing 42 people, damaging 95 percent and completely destroying 12 percent of buildings, damaging or destroying the entire banana crop and 75 percent of forests, rendering virtually the entire population homeless, and leading to the temporary exodus of about a quarter of the population (Benson et al., 2001). Consequently, GDP plummeted by 17 percent, central government current expenditure increased by 31 percent with capital expenditure increasing even more rapidly, and the fiscal deficit increased from 3.1 percent of GDP in 1978 to 8.1 percent in 1981 despite a sizeable increase in foreign grant receipts.

11. **By several measures—frequency, population affected, and value of damage — the ECCU countries are among the most disaster prone in the world (Table II.4)**.[4,5] The

[3] The regressions suffer from hetereoscedasticity, but the results are generally robust to corrections for this using different statistical methods.

[4] Crowards and Coulter (1998), ECLAC (2000), and Pollner (2001) reach a similar conclusion. At a broader level, the findings are also in line with the composite vulnerability indexes proposed by several international institutions (see Atkins et al., 2000; Crowards, 2000a; and United Nations, 2000). In addition to proneness to natural disaster, these indexes include factors such susceptibility to terms of trade shocks and concentration of exports to rank countries according to their overall vulnerability. The different indices all find that small, isolated, and low-income countries are the most vulnerable, with the ECCU countries in most cases ranking among the very most vulnerable.

relative proneness of countries to natural disaster can be quantified in several ways, with different measures highlighting different aspects of risk and vulnerability. When comparing the number of natural disasters during 1970–2002 to land area all six ECCU countries rank among the top-10 most disaster prone in the world. By this measure, they were more than 12 times as exposed as the average country. The incidence is only slightly less severe when one compares the number of disasters to population, with all but one of the six countries ranking in the top 10. On average, a cumulative 85 percent of the ECCU population was affected during the period, compared to a worldwide average of 62 percent. The average cumulative damage was equivalent to 66 percent of annual GDP, compared to a worldwide average of 21 percent.

12. **The higher vulnerability of ECCU countries to natural disasters by measures of frequency than by measures of the severity of impact is consistent with the tendency for countries to become more resilient as they become richer.** Average per capita GDP in the six ECCU countries was US$5,500 in 2002, compared to US$1,400 and US$1,900 for the top-20 most vulnerable countries according to, respectively, the number affected in percent of the population and the damage incurred in percent of GDP. The relatively high level of income in ECCU countries is probably an important mitigating factor for the frequent natural disasters.

C. The Macroeconomic Implications of Natural Disasters

13. **As illustrated in the previous section, natural disasters are associated with substantial costs. In principle, one can distinguish between several sources of loss.** The direct cost of a natural disaster involves loss of assets such as crops, raw materials, and buildings. In addition, there are costs of disruption to normal economic activity caused by disturbance to supply chains and damage to production facilities. Finally, these impacts may cause spillovers at the macroeconomic level, as fiscal and external pressures can lead to imbalances that spark economic crises and increased incidence of poverty can create social unrest. The estimates of damage reported above generally only seek to capture the direct cost (usually excluding the value of lost human capital) and the most tangible sources of indirect cost. It is therefore useful to examine the broader impact.

14. **Natural disasters have a discernable macroeconomic impact in the first few years following an event.** In general, the short-term impact is seen in a contraction of economic output and a worsening of external and fiscal balances, with the impact somewhat softened by an increase in transfers from abroad. The long-term impact is more difficult to assess, but appears to be associated with an increase in the volatility of income and consumption.

---

[5] Interestingly, the results do not reveal clear differences between the ECCU countries. Given that the northern islands (St. Kitts and Nevis, Antigua and Barbuda, and Dominica) are closer to the center of the hurricane belt than the southern islands (St. Lucia, St. Vincent and the Grenadines, and Grenada), one would have expected the former countries to rank higher in terms of vulnerability to natural disaster, but that is not consistently the case.

Short- and Medium-Term Impact

15. **Cross-country studies of the economic effects of natural disasters reveal that these are typically associated with:**

- **An immediate contraction in economic output.** While there is substantial variation, evidence suggests that large natural disasters are usually accompanied by a reduction in same-year GDP growth, with the impact ranging from very small (e.g., 1994 flood and drought in Cambodia) up to 20 percentage points or more (e.g., Dominica in 1979). Looking at Latin America and the Caribbean, Auffret (2003a) considers 16 natural disasters and finds that 1 percent of GDP in direct damage reduced GDP growth by half of 1 percent in the same year; Charvériat (2000) analyzes 35 events with a median damage of 3 percent of GDP and finds that same-year GDP growth fell in 28 cases, with an overall median reduction of 1.7 percent; and Crowards (2000b) finds that same-year GDP growth fell by an average of 3.1 percent following 21 major natural disasters. In general, the effect of the disruption to economic activity is offset by spending on emergency relief and reconstruction, and one would therefore expect the reduction in GDP growth to be temporary, as indeed appears to be the typical pattern, with GDP growth usually rebounding in the year after the event.

- **A worsening of external balances.** Natural disasters typically result in an increase in imports, for reconstruction materials and to compensate for lost production, and exports tend to suffer. For example, ECLAC (2000) considers 42 large natural disasters in Latin America and the Caribbean and finds that these were, on average, associated with a deterioration in the balance of payments by an amount equal to about one-third of the estimated damage; and Crowards (2000b) finds that 21 major natural disasters led to an average worsening of the trade balance by about half and lasting for three years due to an increase in import growth and, to a lesser extent, a reduction in export growth. A country's dependence on agricultural exports appears to be an important indicator of the magnitude of the response, highlighting the vulnerability of this sector (Benson et al., 2001).

- **A deterioration in fiscal balances.** While significant relationships are difficult to establish, natural disasters can put substantial pressure on public finances. Emergency assistance and reconstruction efforts call for higher government expenditure. At the same time, tax revenue may suffer from the decline in economic activity, especially if agricultural exports are a major source of tax revenue. Consequently, the result is usually a widening of the deficit. For example, IMF (2003) finds that five large exogenous shocks in Africa were associated with same-year increases in fiscal deficits of up to 3 percent of GDP. However, in many cases natural disasters appear to have had very little impact on fiscal balances, which may reflect that countries are constrained by existing expenditure envelopes that limit their responses to reallocations (Benson and Clay, 2003a).

- **An increase in poverty.** Natural disasters tend to have a disproportional impact on the poorer segments of the population. Low-income households tend to settle in the most vulnerable areas and rely on poorly constructed housing (World Bank, 2003). In addition, the poor are generally less able to cushion the impact on consumption of disruptions to income owing to small savings and limited access to credit (IMF, 2003). While there thus appears to be a significant increase in poverty following a natural disaster, it is unclear how quickly affected households can recover.

16. **The macroeconomic implications of 12 large natural disasters occurring in the ECCU since 1970 conform to the general pattern and are by some measures more severe than in other regions of the world** (Figure II.3).[6] In the year of the event, the median reduction in real GDP growth was 2.2 percent, reflecting a large decline in agricultural production and an offsetting increase in investment. Exports declined and imports increased, resulting in a staggering 10.8 percent of GDP median increase in the current account deficit, with a gradual recovery in the following years. The impact on external balances appears substantially larger than in other countries, possibly reflecting the very high openness of the ECCU economies. While comprehensive historical data on tourism are not available for the period, the impact on exports suggests that tourism receipts suffered, as this is by far the largest source of foreign-currency earnings in the ECCU, and as hurricanes can cause substantial damage to beaches, coral reefs, and other relevant assets.[7] The impact on the central government was less clear, with a large variation in outcomes. Nevertheless, the tendency appears to have been a marked increase in expenditure and a small reduction in total revenue (including grants) despite an increase in inflows of official assistance and aid. As a result, the median public debt-to-GDP ratio increased sharply by a cumulative 6.5 percentage points over three years.

Long-Term Impact

17. **Natural disasters can affect long-term outcomes through a number of channels,** including through environmental damage on agriculture, fishing, and forestry (ECLAC, 2000). Other effects are more difficult to quantify, but are likely to occur in some situations. For example, destruction of schools may have a long-lasting negative impact on the stock of human capital; reconstruction efforts may crowd out productive public spending, reducing the economic growth rate and the future tax base; increased indebtedness may raise the rate of interest, reducing future investment; and the worsening of fiscal and external balances may trigger inflation, loss of confidence, capital flight, and bank and/or balance of payments crises.[8]

18. **Evidence of a long-term impact on income levels from natural disasters is inconclusive.** There has been little empirical analysis of the impact of natural disasters on long-term outcomes, and drawing firm conclusions is difficult. As shown in Table II.5,

---

[6] The events under consideration are the 12 natural disasters with estimated damages exceeding 2 percent of GDP shown in Table II.3 (the 1987 hurricane and flood in St. Vincent and the Grenadines are treated here as a single event).

[7] Crowards (2000b) finds a median 13 percentage point reduction in the growth rate of tourist arrivals following natural disasters in the Caribbean.

[8] IMF (2003), citing a number of different studies, finds that exogenous shocks and the associated policy responses have contributed to the accumulation of unsustainable external debt in many developing countries, but also that a strong policy response by governments can help prevent a lasting impact on the debt burden.

different measures of disaster proneness do not reveal any persistently significant rank correlations with main macroeconomic indicators, and significant correlations sometimes appear with an unexpected sign. Nevertheless, as one would expect, the rank correlations seem to suggest that proneness to natural disasters: is associated with low per capita income; high volatility of income, consumption, and fiscal balances; a large agricultural sector; and a low investment ratio. Contrary to what one might expect, the number of recorded events divided by land area appears positively correlated with GDP growth. While the World Bank (2003) finds that the evidence of an impact on growth is weak, a positive correlation can be rationalized by arguments such as: natural disasters help initiate adoption of painful but beneficial reforms, or lead to the replacement of capital with newer and more productive varieties (Easterly and Kraay, 2000). However, the positive correlation contrasts with findings described in Benson and Clay (2003b), which suggest that hazard proneness has a negative impact on economic growth.

19. **The tendency of natural disasters to increase volatility appears more solid, although the direct effect may be relatively modest.** The Caribbean suffers from a very high level of consumption volatility, impacting negatively on welfare given people's desire for consumption smoothing. This could plausibly be the result of the region's proneness to natural disasters, as suggested by the finding of generally positive rank correlations between the measures of proneness to natural disaster and measures of volatility. However, using cross-country regression analysis, the World Bank (2003) finds that, while natural disasters have a significant impact on income volatility in the Caribbean region, the direct impact on consumption volatility is statistically insignificant. Also, although there is substantial variation between countries, income volatility in the Caribbean is not especially high (Table II.6).[9] This suggests that the impact of natural disasters on aggregate volatility is not a dominating determinant, which is perhaps not so surprising given that large events are relatively rare occurrences. In addition, the very high degree of consumption volatility in the Caribbean probably has less to do with proneness to natural disaster than it has to do with inadequate mechanisms for consumption smoothing—in particular a dearth of credit and insurance to compensate for temporary losses.[10] This is likely to be a particularly significant problem for the poor, who have fewer liquid assets and less insurance coverage.

D. Mitigating Natural Disasters

20. **The cost of natural disasters to individual countries can be substantially mitigated.** Insurance and capital markets can provide compensation for loss of capital and income, alleviating the damage to household and government balance sheets, and reducing the immediate impact on consumption possibilities. Good building practices and other

[9] This result refers to the standard deviation of annual real GDP growth. Interestingly, as documented in Chapter I of this paper, filtering out the effect of business cycles dramatically increases the volatility of real GDP growth in the ECCU relative to that of other countries.

[10] The relatively limited role of insurance in the Caribbean may indirectly be a result of the proneness to natural hazards, which may impede the efficiency of the insurance market.

precautionary arrangements can lessen the impact of disasters in the first place. Unfortunately, these mechanisms function poorly in many of the countries most vulnerable to natural disasters, including the ECCU countries.

Coping With Risk: The Role of Insurance and Credit Markets

21. **Insurance markets can reduce the negative impact of natural disasters by spreading the burden over space and time.** The insurance market is mainly international, with local insurers re-insuring part of their exposure with larger, often global, companies. However, the market for natural hazard insurance does not operate very smoothly and is limited in scope. As described in Pollner (2001), natural disasters are 'high severity, low frequency' events that are more difficult to manage for insurance companies than the 'low severity, high frequency' risk that they prefer to cover. In addition, objective information on damage and risks is difficult to obtain. Consequently, the market for catastrophe risk insurance is well known to be inefficient, with high price of coverage, excessive volatility, and insufficient pooling of risk. A more efficient risk sharing procedure would use capital markets to spread the exposure to a larger number of investors. The recent emergence of "cat" bonds in advanced markets can help address the problem, but these are still not very widespread (Box II.1).[11]

[11] See Pollner (2001) for an overview of new financial instruments for managing weather and disaster risks.

Box II.1: New Instruments for Dealing with Natural Hazard Risk

A number of capital market instruments have recently become available for weather- and disaster-related risks. Most prominent among these are catastrophe bonds, or cat bonds, with other instruments including exchange-traded catastrophe options, catastrophe swaps and weather derivatives. Cat bonds offer high yields but are subject to default if a covered catastrophe occurs during the life of the bond. Securitizing catastrophe risk in this way enables the risk to be spread more widely, thereby improving the efficiency of risk transfer. While these new instruments are still in their infancy and have so far only been used in developed countries, they could help developing countries obtain large-scale protection against natural hazard risk. For example, a government could issue a cat bond to protect itself against the risk of a major hurricane. The proceeds from the bond would then be invested in risk-free securities with the spread between the two effectively representing the recurring cost of insurance. If the specified hurricane occurs, the government would default on the cat bond and would then be free to use the funds placed in risk free securities to cover its reconstruction costs. In order to minimize ambiguity, the bond should be tied to objective criteria such as wind-speed or flood height at a specified location.

22. **The shortcomings of the market for natural hazard insurance are especially pronounced in developing countries, including the ECCU.** This is evident in the fact that the percentage of natural disaster damage covered by insurance is much lower than in advanced economies. Poorly developed legal and financial systems (where issues related to natural hazards are concerned), as well as the large exposure to natural hazards and their frequent occurrence mean that the cost of insurance in these countries is high and volatile. As a result, insurance penetration and the quantity of risk transfer is low (Freeman et al., 2003). Latin America and the Caribbean has the lowest insurance cover of any region in the world, with only 3.9 percent of 1985–99 natural disaster damage covered by insurance, compared to 34.5 percent in North America—the region with the highest coverage (Charvériat, 2000).

23. While the ECCU insurance market is relatively advanced in comparison to that in other developing countries, coverage is not very widespread and costs are much higher than in advanced economies. Relative to the economy total property insurance premiums in the ECCU are not that much lower than in the U.S. (about 2.4 percent of GDP compared to 3.3 percent). However, this is largely a reflection of high prices, with base property insurance rates in the ECCU countries about double the rate prevailing in less hurricane-exposed cities in the U.S. (Pollner, 2001). Also, the vast majority of property insurance relates to large commercial businesses, especially in the tourism sector. In contrast, even though lenders typically require mortgage holders to be insured, a large part of private dwellings are uninsured, particularly among low-income households. Public sector use of market insurance is generally very limited, although St. Kitts and Nevis has recently moved toward insuring a majority of government assets (World Bank, 2003). In addition, crop insurance is not always available to farmers, one exception being the WINCROP scheme.[12]

[12] The Windward Islands Crop Insurance, or WINCROP, provides storm insurance for banana growers. The scheme, which covers the entire export crop in Dominica, Grenada,

(continued)

Overall, the insurance market suffers from a high expense ratio, high fragmentation, and a low level of available risk capital.[13] With a limited domestic capital base and about 80 percent of gross property insurance premiums transferred to re-insurers, the East Caribbean insurance market is highly exposed to the volatile global re-insurance market. This has caused local insurance rates to be unduly affected by natural catastrophes in industrial countries. For example, the swings in global re-insurance rates following Hurricane Andrew in Florida (1992) and the Northridge earthquake in California (1994), had a pronounced impact on property insurance rates in the Eastern Caribbean, with the annual cost of insurance jumping from 0.4 percent of insured value in 1990, to 1.3 percent in 1994, and back to 0.7 percent in 1998.

Domestic Public Policy to Reduce Risk and Lessen the Impact

24. **While many countries have taken steps to improve their preparedness, increasing the efficacy of domestic policy measures could help reduce the adverse effects of natural disasters.** Of particular importance in the ECCU is the need to improve the functioning of the insurance market, to increase coverage in the face of the high natural hazard risk and in order to reduce economic volatility. Here, government property could be insured more widely, possibly by using cat bonds or other financial innovations. Policies to encourage more widespread insurance of dwellings and crops would also be beneficial, particularly in low-income communities. Strengthening financial regulation would improve the insurance product, making it attractive to a wider segment of the economy.

25. **In addition to promoting market-based insurance, very modest investments can often substantially reduce the structural vulnerability of infrastructure and buildings**. By one estimate, investments of US$40 billion in disaster preparedness, prevention, and mitigation would have reduced global economic losses in the 1990s by US$280 billion (Freeman et al., 2003). For example, simple measures such as tying walls to foundation and roofs to walls may dramatically increase buildings' resistance to hurricanes (Pollner, 2001). Well designed and strictly enforced building codes and zoning regulation are central to ensuring that construction methods are appropriate for the local environment. Implementing hurricane-resistant home improvement programs to encourage safer building practices in the informal sector, as done in Antigua and Barbuda, Dominica, and St. Lucia, can also have very positive results. In other areas, governments should refrain from subsidizing monoculture, as diversification within agriculture and from agriculture to other sectors would lessen the concentration of risk.

26. **The high vulnerability to natural hazards in the ECCU countries cannot be eliminated, however, and it is important for governments to be prepared for the next**

St. Lucia and St. Vincent and the Grenadines, only provides cover against a small proportion (20 percent) of losses, but this has proven sufficient to enable growers to rehabilitate quickly.

[13] As documented by Pollner (2001), expense ratios of local insurance companies are between 30–40 percent of premium income, compared to the U.S. average of 26–28 percent.

large disaster. Further development of emergency procedures would facilitate an effective and speedy response, and help ensure that social safety nets are in place when needed without relying extensively on administrative discretion. Accumulation of contingency funds, such as those held at the Eastern Caribbean Central Bank (ECCB), would also help in this regard.[14]

International Assistance and Cooperation

27. **External assistance plays an important role in helping countries mitigate the effects of exogenous shocks, but more is needed.** An increasing share of official development assistance is being devoted to emergency assistance, and multilateral financial institutions are also doing more in this area.[15] Nevertheless, the very rapid increase in the frequency of natural disasters around the world suggests a need for increasing efforts in this area. In addition, the majority of external assistance for natural disasters has been concentrated on a few very visible events, and it is possible that smaller disasters getting little media coverage are receiving too small a share of assistance (IMF, 2003).

28. **The IMF has several instruments for providing financial assistance in response to natural disasters.**

- **The emergency assistance for natural disaster** (EAND) facility aims to provide quick-disbursing assistance to member countries that cannot meet their immediate financing needs arising from a natural disaster without a serious depletion of their foreign reserves. Assistance is not subject to phasing or performance criteria (although the member is required to provide a statement of policies) and access is generally limited to 25 percent of quota. The EAND facility has been used 25 times since 1962, at an average of 31 percent of quota,

[14] The ECCB has a fiscal reserve account to assist member countries facing economic difficulties, including those caused by natural disasters. Contributions to the account are mandatory, with an amount automatically deducted from the profits owed to each member country, and the terms of drawings are determined on a case-by-case basis. The account, which has been in place for a decade, currently holds about EC$12 million and has only been used once (not in relation to a natural disaster).

[15] See IMF (2003) for an overview of international financing mechanisms for addressing exogenous shocks. Of particular relevance for the ECCU are the programs sponsored by the Caribbean Development Bank (CDB), the Caribbean Disaster Emergency Response Agency (CDERA), and the World Bank. The CDB provides assistance for disaster relief, mitigation, and preparedness projects, and disbursed US$50 million in loans for 27 operations during 1998–2001. CDERA is a regional agency established by CARICOM in 1991 to provide immediate and coordinated response to disastrous events in member countries. Whilst the Agency's mandate originally focused on disaster response, it is now engaged in a wide array of services, ranging from local information campaigns to logistical support for dispatch of relief supplies. The World Bank has a number of ongoing projects in the region relating to disaster management and emergency recovery.

including by Grenada (2003), St. Kitts and Nevis (1998), St. Lucia (1980), St. Vincent and the Grenadines (1980), and Dominica (1979).

- **The compensatory financing facility** (CFF), while not directly targeted at natural disasters, is another source of IMF financing that could appropriately be used. The CFF was established in the 1960s to assist countries experiencing either a temporary decline in export earnings or a temporary increase in the cost of cereal imports. Access is formula-based—determined by calculating the deviation of the shortfall or excess year from the trend over a five-year period—and limited to 45 percent of quota (55 percent for combined shocks). Stand-alone purchases are free from conditionality. The facility has been used 344 times, at an average of 36 percent of quota, with 42 purchases since 1990 of which 8 were for weather-related causes. No purchases have been made under the facility since 1999.

- **Stand-By arrangements in the credit tranches** are general purpose financing instruments that have been used to assist members with all types of balance of payments difficulties, including those resulting from natural disasters. While Stand-By arrangements in the credit tranches offer more flexibility than the CFF and potentially greater amounts than both the EAND and the CFF, purchases are subject to conditionality and the facility has rarely been used as a stand-alone response to natural disasters.

- **PRGF arrangements** are the Fund's principal means of providing concessional financing to low-income countries. For countries with an existing PRGF arrangement, augmentation may be a practical response to an exogenous shock. As of end-August 2003, augmentation had occurred in 23 of 93 PRGF arrangements. These augmentations were mostly in response to exogenous shocks and the median size was 10 percent of quota.

29. **In view of the comparatively large resource needs following disasters in small countries, IMF resources available for countries hit by natural disaster are relatively limited.** The EAND facility would be the most obvious candidate for Fund financing in the event of a natural disaster. However, the funds available here often pale in comparison to the cost of shocks—the average amount of financing given in the five cases where ECCU countries have used this facility was only US$2.1 million, about 5 percent of the estimated damage. In addition, except for PRGF purchases, IMF funds are subject to the standard rate of charge on GRA resources, which is onerous for low-income countries. The main benefit of Fund assistance following a natural disaster is that it can be provided relatively quickly (for EAND usually within two or three months after the event) with relatively little conditionality (for EAND and CFF), and that it can act as a catalyst for other donor flows. Stand-By and PRGF arrangements, while allowing for larger access, are slower to disburse and subject to conditionality.

E. Summary of Findings

30. **The evidence presented in this chapter shows that natural disasters have important macroeconomic implications:**

- Across countries, natural disasters on average affect about 2 percent of the population each year and cause damage of well over one-half of 1 percent of GDP. The incidence is

especially pronounced in developing countries, with the ECCU countries standing out as among the most vulnerable in the world. Given the increasing frequency of events, there is a need for polices to better mitigate and respond to these occurrences.

- Natural disasters are typically associated with an immediate contraction in economic output, a worsening of external and fiscal balances, and an increase in poverty. Although their vulnerability is mostly the result of a high frequency of events (typically hurricanes), the highly open ECCU countries also appear to suffer particularly large impacts on external balances.

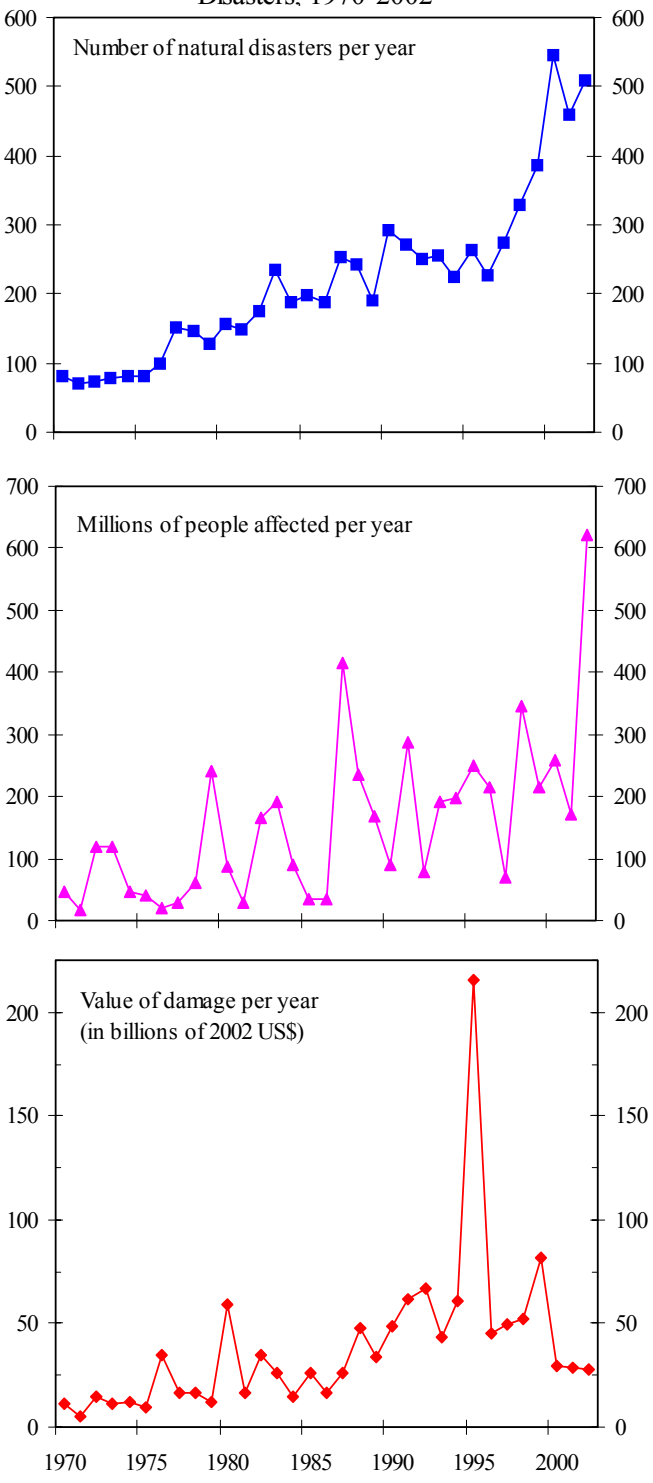
- While the long-term impact of natural disasters is hard to quantify, rank correlations suggest that proneness to natural disaster is associated with low per capita income; high volatility of income, consumption, and fiscal balances; a large agricultural sector; and a low investment ratio.

- The proneness of developing countries to natural disasters contrasts to the limited role of insurance in these countries. Although the market is more advanced than in many other developing countries, property insurance is not very widespread in the ECCU, especially among low-income households. Overall, the ECCU insurance market suffers from a high expense ratio, high fragmentation, high volatility, and a small capital base.

- Modest investments in preventive measures can often substantially mitigate the impact of natural hazards. Natural disasters cannot be eliminated, however, and it is important for governments to be prepared. In ECCU countries, a tighter fiscal policy during good times would leave more room for expenditure increases in emergencies, reducing the risk that a natural disaster leads to an economic crisis. Accumulation of contingency funds would bring important benefits in this regard.

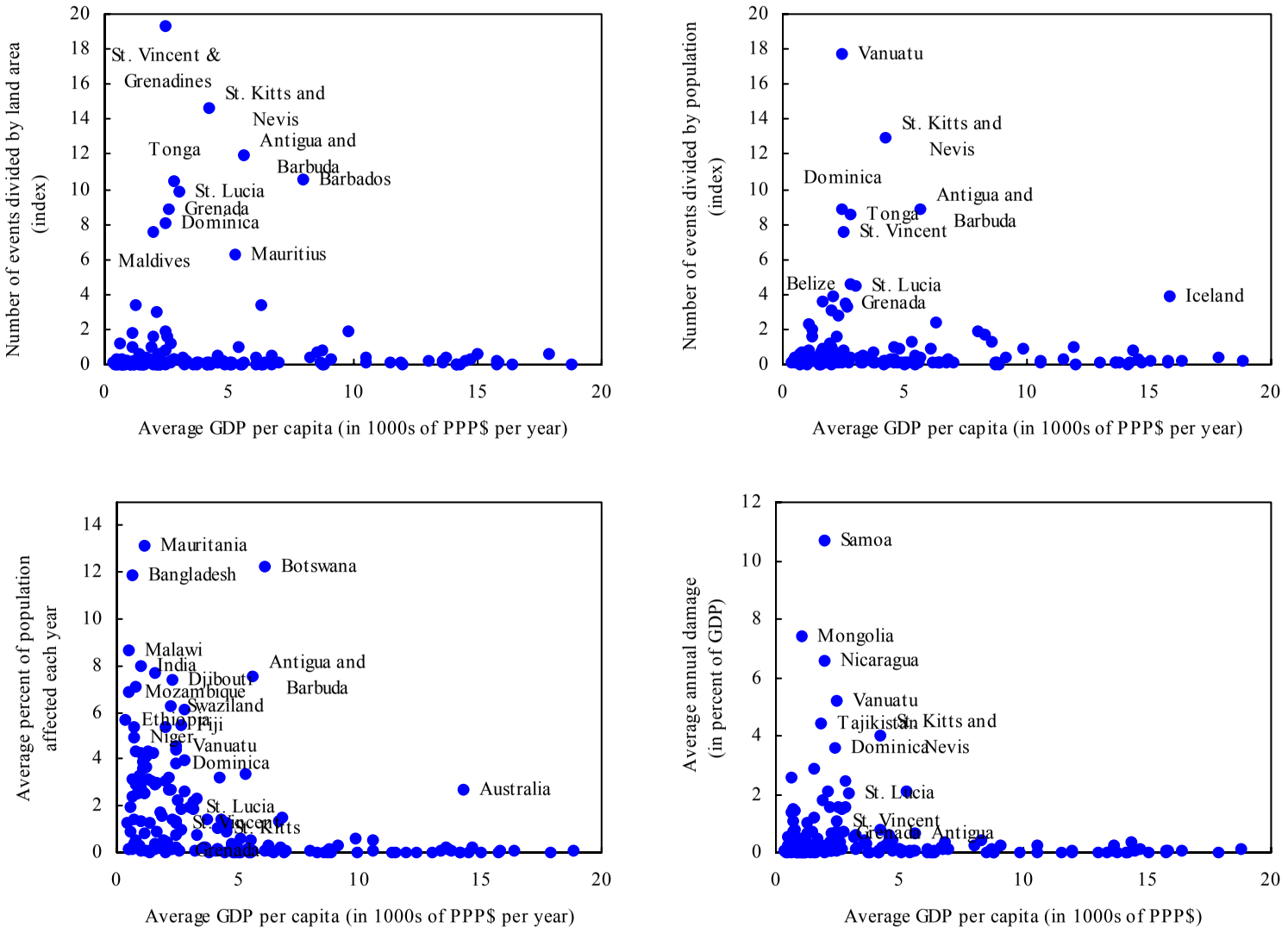
- International assistance has played an important role in helping countries faced with natural disasters. More can be done, however, not least by the IMF, where resources available for countries hit by natural disasters are relatively limited.

Figure II. 1. Global Frequency and Impact of Natural Disasters, 1970-2002



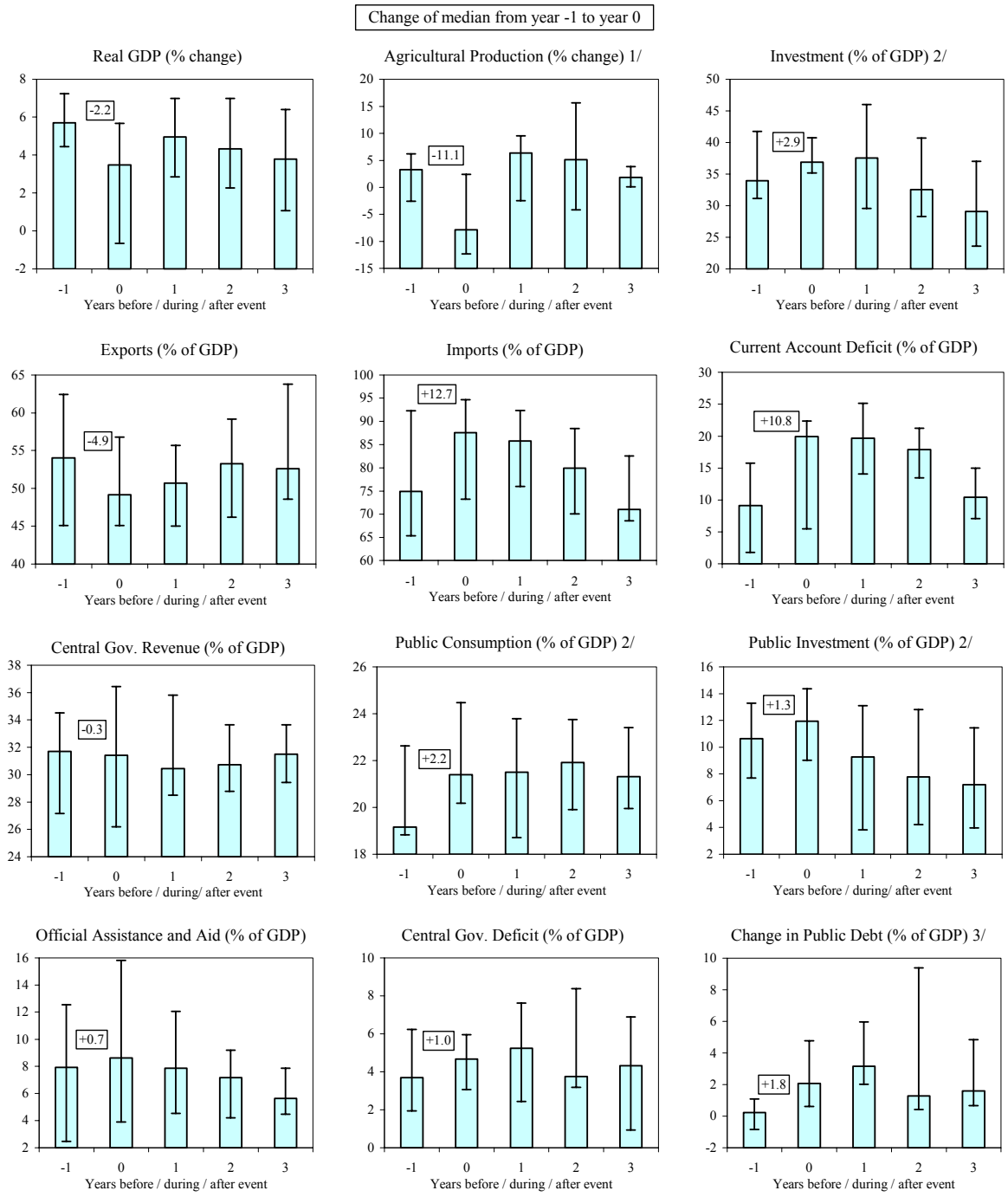
Source: EM-DAT; World Economic Outlook.

Figure II.2. Cross-Country Frequency and Impact of Natural Disasters, 1970-2002



Source: EM-DAT; World Economic Outlook.

Figure II.3: Median Impact of 12 Large Natural Disasters in the ECCU, 1970-02



Source: World Economic Outlook, World Development Indicators, and Fund Staff Calculations .
Note: Includes the 12 natural disasters with estimated damages exceeding 2 percent of GDP shown in Table II.3 (the 1987 hurricane and flood in St Vincent and the Grenadines are treated as a single event). Bars indicate the range between the first and the third quartile of the distribution.
1/ Excludes Grenada 1975 and St. Lucia 1980.
2/ Excludes Grenada 1975 and 1980.
3/ Excludes Antigua and Barbuda 1989, Dominica 1979, and St. Lucia 1980.

Table II.1: Frequency and Impact of Natural Disasters, 1970–2002 1/

	1970s	1980s	1990s	1970–2002	Ratio 1990s to 1970s
In ECCU countries (six Fund members)					
Number of natural disasters	6	18	18	44	3.0
Number affected (in thousands of persons)	94	200	96	390	1.0
In percent of population 2/	2.08	3.93	2.53	2.59	1.2
Number of observations	3	11	16	31	5.3
Damage (in millions of 2002 US$)	107	424	277	808	2.6
In percent of GDP 3/	1.90	2.98	1.70	2.00	0.9
Number of observations	2	11	5	18	2.5
In developing countries (excluding ECCU, 120 countries)					
Number of natural disasters	643	1,296	1,924	4,952	3.0
Number affected (in millions of persons)	723	1,429	1,886	5063	2.6
In percent of population 2/	1.50	2.61	2.31	2.22	1.5
Number of observations	447	890	1531	3,738	3.4
Damage (in billions of 2002 US$)	72	106	257	479	3.6
In percent of GDP 3/	0.46	0.65	0.93	0.69	2.0
Number of observations	225	347	502	1,276	2.2
In advanced economies (24 countries)					
Number of natural disasters	204	433	583	1,484	2.9
Number affected (in millions of persons)	6.2	6.7	34.2	49.5	5.5
In percent of population 2/	0.08	0.05	0.52	0.20	6.3
Number of observations	73	158	316	742	4.3
Damage (in billions of 2002 US$)	60	149	406	650	6.8
In percent of GDP 3/	0.06	0.10	0.08	0.08	1.4
Number of observations	97	221	351	742	3.6
Worldwide (150 countries)					
Number of natural disasters	853	1,747	2,525	6,480	3.0
Number affected (in billions of persons)	0.73	1.44	1.92	5.11	2.6
In percent of population 2/	1.28	2.24	1.95	1.88	1.5
Number of observations	523	1,059	1,863	4,511	3.6
Damage (in billions of 2002 US$)	132	256	663	1,130	5.0
In percent of GDP 3/	0.45	0.65	0.82	0.64	1.8
Number of observations	324	579	858	2,036	2.6

Sources: EM-DAT; World Economic Outlook; and Fund staff calculations.

1/ Based on EM-DAT (CRED, 2003), natural disasters are defined as events due to natural causes that caused 10 or more fatalities, affected 100 or more people, or resulted in a call for international assistance or the declaration of a state of emergency. The total number of affected is defined as people that have been injured, made homeless, or requiring immediate assistance during a period of emergency. Figures omit countries without at least one natural disaster associated with a cost estimate and/or missing information on GDP.

2/ Average number affected each year in percent of population. Figures are unweighted averages across countries.

3/ Average damage each year in percent of GDP. Figures are unweighted averages across countries.

Table II.2: Determinants of Vulnerability to Natural Disaster, 1970-2002

Dependent variable	Estimated coefficients: Number of Events Divided by Population	Estimated coefficients: PPP-Based GDP per capita (logged)	Estimated coefficients: Agricultural employment (share in total)	R-squared	F-test
Affected in percent of population	11.977 *	-29.243 ***	0.827 *	0.418	18.88
	(6.608)	(9.994)	(0.472)		
Damage in percent of annual GDP	11.758 **	-14.843 *	0.210	0.225	7.63
	(5.005)	(7.573)	(0.357)		

Note: OLS regressions based on 83 observations and including a constant (not shown). Figures in parentheses are standard deviations. "*", "**", and "***" indicate significance at, respectively, the 10, 5, and 1 percent level.

Table II.3: Natural Disasters in ECCU Countries, 1970–2002

Country	Year	Event	Total persons affected		Estimated damage	
			Number	% of population	In US$ 1000's	% of GDP
Antigua and Barbuda	1983	Drought	75,000	100.0	…	…
Antigua and Barbuda	1989	Hurricane Hugo	8,030	12.4	80,000	21.4
Antigua and Barbuda	1990	Hurricane Gustav	…	…	…	…
Antigua and Barbuda	1995	Hurricane Luis	68,702	100.0	500	0.1
Antigua and Barbuda	1998	Hurricane Georges	2,025	3.0	…	…
Antigua and Barbuda	1999	Hurricane Jose	2,534	3.8	…	…
Antigua and Barbuda	1999	Hurricane Lenny	3,423	5.1	…	…
Dominica	1970	Hurricane	…	…	…	…
Dominica	1979	Hurricanes David and Frederick	72,100	100.0	44,650	100.8
Dominica	1980	Hurricane Allen	…	…	…	…
Dominica	1984	Hurricane Klaus	10,000	14.2	2,000	2.2
Dominica	1989	Hurricane Hugo	710	1.0	20,000	13.0
Dominica	1995	Hurricane Luis	3,001	4.2	3,428	1.6
Dominica	1999	Hurricane Lenny	715	1.0	…	…
Dominica	2001	Hurricane Iris	175	0.2	…	…
Grenada	1975	Flood	…	…	4,700	13.4
Grenada	1980	Hurricane Allen	…	…	5,300	7.7
Grenada	1990	Tropical storm Arthur	1,000	1.1	…	…
Grenada	1999	Hurricane Lenny	210	0.2	5,500	1.5
St Kitts and Nevis	1984	Hurricane Klaus	…	…	…	…
St Kitts and Nevis	1987	Flood	…	…	500	0.6
St Kitts and Nevis	1989	Hurricane Hugo	1,330	3.1	46,000	32.1
St Kitts and Nevis	1990	Hurricane Gustav	…	…	…	…
St Kitts and Nevis	1995	Hurricane Luis	1,800	4.2	197,000	85.4
St Kitts and Nevis	1998	Hurricane Georges	10,000	23.2	…	…
St Kitts and Nevis	1999	Hurricane Lenny	1,180	2.7	41,400	13.6
St Lucia	1980	Hurricane Allen	80,000	61.5	87,990	66.0
St Lucia	1983	Storm	3,000	2.2	1,290	0.8
St Lucia	1986	Tropical storm Danielle	…	…	…	…
St Lucia	1987	Hurricane Emily	…	…	…	…
St Lucia	1988	Hurricane Gilbert	…	…	…	…
St Lucia	1994	Tropical storm Debby	750	0.5	…	…
St Lucia	1996	Landslide	175	0.1	…	…
St Lucia	1999	Hurricane Lenny	200	0.1	…	…
St Vincent and the Grenadines	1971	Volcano	2,000	2.3	…	…
St Vincent and the Grenadines	1977	Flood	…	…	…	…
St Vincent and the Grenadines	1979	Volcano	20,000	18.6	…	…
St Vincent and the Grenadines	1980	Hurricane Allen	20,500	18.8	16,300	27.6
St Vincent and the Grenadines	1986	Flood	152	0.1	…	…
St Vincent and the Grenadines	1987	Hurricane Emily	208	0.2	5,300	3.7
St Vincent and the Grenadines	1987	Flood	1,000	0.9	5,000	3.5
St Vincent and the Grenadines	1992	Flood	200	0.2	…	…
St Vincent and the Grenadines	1999	Hurricane Lenny	100	0.1	…	…
St Vincent and the Grenadines	2002	Hurricane Lili	…	…	…	…

Sources: EM-DAT; World Economic Outlook and Fund staff estimates.

Table II.4: The Incidence of Natural Disasters in the ECCU Compared to the Rest of the World, 1970–2002

	All Recorded Disasters					With Estimates of Affected			With Estimates of Damage		
	Number of Events	Number Divided by Land Area (Index)	Rank	Number divided by population (Index)	Rank	Number of Events	Cumulative Affected in Percent of Population	Rank	Number of Events	Cumulative Damage in Percent of Annual GDP	Rank
All countries	6,480	100	76	100	76	4,511	62	76	2,036	21	76
Advanced economies	1,511	23	70	39	91	742	7	119	742	3	104
Caribbean	162	599	23	387	23	114	65	66	58	37	46
ECCU	44	1,212	5	770	6	31	85	58	18	66	19
Antigua and Barbuda	7	1,198	3	883	4	6	248	7	2	22	34
Dominica	8	803	8	890	3	6	125	27	4	118	7
Grenada	4	886	7	348	12	2	1	127	3	23	32
St. Kitts and Nevis	7	1,465	2	1,295	2	4	33	70	4	132	6
St. Lucia	8	988	6	451	8	5	64	52	2	67	13
St. Vincent and Grenadines	10	1,931	1	755	6	8	41	67	3	35	23
Other Caribbean	118	190	36	131	35	83	52	71	40	17	63
Other	4,807	49	84	75	79	3,655	74	67	1,236	23	73
GDP per capita of top-20 1/	…	…	4.2	…	5.5	…	…	1.4	…	…	1.9

Sources: EM-DAT for data on natural disasters, including estimates of the number of people affected and the value of damage; World Development Indicators for data on land size; World Economic Outlook for data on GDP and population.

Note: The sample contains 150 countries after omitting countries without at least one natural disaster associated with a cost estimate and/or missing information on GDP (24 advanced economies, 15 Caribbean countries, and 111 other developing countries). Simple unweighted averages are used for country groupings. Rankings are in descending order, with "1" indicating the most exposed to natural disaster.

1/ In 1000s of US$ in 2002.

Table II.5: Correlations Between Measures of Proneness to Natural Disasters and Selected Macroeconomic Variables, 1970–2002

	freq1	freq2	affect	damage	lpppc	lgdpc	ggdpc	grgdp	vrgdp	vcons	vgovbp	agri	tiratio
Number of events divided by country area													
Number of obs	150	150	150	150	150	149	149	149	149	120	140	137	117
Correlation	…	0.67	0.08	0.23	-0.06	-0.07	0.05	0.20	-0.05	0.19	0.07	-0.10	-0.10
Spearman's rho	…	**0.57**	**0.20**	**0.28**	0.05	0.07	**0.24**	**0.16**	-0.11	0.09	-0.05	0.01	0.01
P-value	…	**0.00**	**0.01**	**0.00**	0.55	0.40	**0.00**	**0.05**	0.17	0.35	0.58	0.91	0.93
Number of events divided by country population													
Number of obs	150	150	150	150	150	149	149	149	149	120	140	137	117
Correlation	0.67	…	0.22	0.43	-0.09	-0.08	0.01	0.12	-0.04	0.18	0.06	-0.06	-0.07
Spearman's rho	**0.57**	…	**0.46**	**0.35**	-0.15	-0.14	-0.07	0.12	0.04	**0.31**	**0.22**	0.12	**-0.22**
P-value	**0.00**	…	**0.00**	**0.00**	0.07	0.09	0.41	0.15	0.60	**0.00**	**0.01**	0.16	**0.02**
Affected in percent of population													
Number of obs	150	150	150	150	150	149	149	149	149	120	140	137	117
Correlation	0.08	0.22	…	0.26	-0.40	-0.35	-0.08	0.20	0.04	0.29	0.15	0.36	-0.34
Spearman's rho	**0.20**	**0.46**	…	**0.54**	**-0.61**	**-0.62**	**-0.27**	**0.19**	**0.17**	**0.43**	0.07	**0.53**	**-0.47**
P-value	**0.01**	**0.00**	…	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**	**0.03**	**0.00**	0.43	**0.00**	**0.00**
Damage in percent of GDP													
Number of obs	150	150	150	150	150	149	149	149	149	120	140	137	117
Correlation	0.23	0.43	0.26	…	-0.23	-0.20	-0.05	-0.04	0.08	0.11	0.08	0.13	-0.18
Spearman's rho	**0.28**	**0.35**	**0.54**	…	**-0.28**	**-0.26**	-0.02	0.13	0.05	0.14	-0.02	**0.25**	-0.15
P-value	**0.00**	**0.00**	**0.00**	…	**0.00**	**0.00**	0.81	0.12	0.52	0.13	0.85	**0.00**	0.10

Note: Bolded figures indicate that the rank correlations are significant at the 5 percent level (one-sided test). A positive correlation suggests that higher values of the variable are associated with an increased proneness to natural disaster, as reflected by the four measures in the first column.

Sources: International Financial Statistics; World Economic Outlook; and World Development Indicators.

Variables: freq1 , number of events divided by country land area; *freq2* , number of events divided by country population; *affect* , percentage of population affected; *damage* , damage in percent of annual GDP; *lpppc* , average level of current price GDP per capita at PPP exchange rate; *lgdpc* , average level of current price GDP in USD per capita; *ggdpc* , average growth rate of current price GDP in USD per capita; *grgdp* , average growth rate of constant price GDP; *vrgdp* , standard deviation of constant price GDP; *vcons* , standard deviation of total consumption in US dollars; *vgovbp* , standard deviation of central government balance in percent of GDP; *agri,* share of agriculture in GDP; *tiratio* , average ratio of total investment to GDP

Table II.6. Volatility in Income and Consumption Growth, 1970–99

(Standard deviation of growth rates in percent)

		Consumption	
	GDP	Private	Public
ECCU	5.1	9.3	12.6
Antigua and Barbuda	3.0	10.0	10.2
Dominica	9.1	7.8	6.4
Grenada	2.2	6.2	17.3
St. Kitts and Nevis	3.7	7.4	22.4
St. Lucia	8.5	13.5	12.6
St. Vincent and the Grenadines	4.2	10.7	6.9
Caribbean	4.0	9.8	12.8
Latin America	3.5	6.7	10.5
Pacific Islands	5.6	6.3	10.9
Low income	4.8	8.3	11.7
Lower middle income	4.0	5.3	7.8
Upper middle income	4.1	5.9	5.7
OECD	2.1	2.0	1.6

Source: World Bank (2003).

References

Atkins, J.P., S. Mazzi, and C.D. Easter, 2000, "A Commonwealth Vulnerability Index for Developing Countries: The Position of Small States," Economic Paper No. 40, Commonwealth Secretariat.

Auffret, P., 2003a, "High Consumption Volatility: the Impact of Natural Disasters," World Bank Working Paper No. 2962, World Bank.

Auffret, P., 2003b, "Catastrophe Insurance Market in the Caribbean Region: Market Failures and Recommendations for Public Sector Interventions," Policy Research Working Paper No. 2963, World Bank.

Benson, C., E. Clay, F.V. Michael, and A.W. Robertson, 2001, "Dominica: Natural Disasters and Economic Development in a Small Island State," Disaster Risk Management Working Paper Series No. 2, World Bank.

Benson, C., and E. Clay, 2003a, "Economic and Financial Impacts of Natural Disasters: an Assessment of Their Effects and Options for Mitigation," London: Overseas Development Institute.

Benson, C., and E. Clay, 2003b, "Disasters, Vulnerability and the Global Economy," in A. Kreimer, M. Arnold, and A. Carlin (Eds.), *Building Safer Cities: The Future of Disaster Risk*, Disaster Risk Management Series No. 3, World Bank.

Charvériat, C., 2000, "Natural Disasters in Latin America and the Caribbean: An Overview of Risk," Working Paper No. 434, Inter-American Development Bank.

Collier, P., and J. Dehn, 2001, "Aid, Shocks, and Growth," World Bank Working Paper No. 2688, World Bank.

Crowards, T., and W. Coulter (1998), "Measuring The Comparative Vulnerability of the Eastern Caribbean," Caribbean Development Bank.

Crowards, T., 2000a, "An Index of Inherent Economic Vulnerability of Developing Countries," Staff Working Paper No. 6/00, Caribbean Development Bank.

Crowards, T., 2000b, "Comparative Vulnerability to Natural Disasters in the Caribbean," Staff Working Paper No. 1/00, Caribbean Development Bank.

CRED, 2003, "EM-DAT: The OFA/CRED International Disaster Database 1990–2002," http://www.cred.be/emdat, Centre for Research on the Epidemiology of Disasters.

Easterly, W., and A. Kraay, 2000, "Small States, Small Problems? Income, Growth, and Volatility in Small States," *World Development*, Vol. 28, pp. 2013–2027.

ECLAC, 2000, "A Matter of Development: How to Reduce Vulnerability in the Face of Natural Disasters," paper prepared by the Economic Commission for Latin America and the Inter-American Development Bank.

Freeman, P.K., M. Keen, and M. Mani, 2003, "Dealing with Increased Risk of Natural Disasters: Challenges and Options," IMF Working Paper WP/03/197, International Monetary Fund.

IPCC, 2001, "Third Assessment Report - Climate Change 2001," Intergovernmental Panel on Climate Change.

International Monetary Fund, 2003, *Fund Assistance to Countries Facing Exogenous Shocks*, (www.imf.org), International Monetary Fund.

Pollner, J., 2001, "Managing Catastrophic Disaster Risk Using Alternative Risk Financing and Pooled Insurance Systems," World Bank Technical Paper No. 495, World Bank.

Munich Re, 2001, "Annual Review of Natural Catastrophes," Munich, Germany: Munich Re Group.

United Nations, 2000, "Report of the Expert Group Meeting on Economic Vulnerability."

World Bank, 2001, *World Development Report 2000/2001: Attacking Poverty*, Washington, DC: World Bank.

World Bank, 2002, Natural Hazard Risk Management in the Caribbean: Revisiting the Challenge, Report No. 24166-LAC, World Bank.

World Bank, 2003, "Caribbean Economic Overview 2002: Macroeconomic Volatility, Household Vulnerability, and Institutional and Policy Responses," Report No. 24165-LAC, World Bank.

III. Competitiveness in the ECCU: Measures of the Real Exchange Rate[1]

A. Introduction

1. **The external environment faced by the Eastern Caribbean Currency Union (ECCU) has been more adverse in the last decade than it was prior to the 1990s.** A series of exogenous shocks have hit the ECCU region in recent years, including: the terrorism-induced decline in tourism; a series of natural disasters affecting the region; the dismantling of preferential trade agreements and their impact on traditional agricultural exports (bananas and sugar); and the Financial Action Task Force (FATF) initiatives on offshore financial services arrangements.

2. **The region is also experiencing a loss of market share in its principal export—tourism—though receipts have not declined significantly (see International Monetary Fund, 2003).** Tourism indicators show that the ECCU's share of the Caribbean tourism market has declined as other non-CARICOM tourist destinations—notably Cuba, Dominican Republic and Mexico—have rapidly increased their market share (Table III.1). The composition of tourists visiting the ECCU has also changed: stayover tourist arrivals in the ECCU have declined relative to the Caribbean totals, while cruise passengers arrivals have increased. Since tourism receipts have not declined as much in relative terms, this could signal that the ECCU is moving towards a more high-income (smaller) market segment.

3. **This chapter assesses the extent to which ECCU real exchange rates have appreciated over time, and whether the region has lost competitiveness.** Two approaches are taken to assess the movement of the real exchange rate over time. The first approach looks at traditional real effective exchange rate measures, based on the ratio of nontradable to tradable prices and on the ratio of domestic to foreign prices.[2] The second is based on specially constructed measures that are more appropriate for tourism-dominated economies. These measures are based on real exchange rates vis-à-vis: (i) major competitors of the ECCU in the tourism sector; and (ii) major customers of the ECCU tourism sector.

---

[1] Prepared by Paul Cashin, Patrick Njoroge, and Pedro Rodriguez.

[2] The ratio of nontradable to tradable prices is used more frequently when the purpose is to analyze the allocation of resources between the tradable and nontradable sectors; the ratio of domestic to foreign prices is mostly used when the purpose is to assess the competitiveness of one country vis-à-vis another country.

B. Analysis of Traditional Real Exchange Rate Measures

4. **Real exchange rates are traditionally measured in one of two ways:**

- First, as the ratio of the domestic price of nontradable goods to the domestic price of tradable goods**.** In equation (1), $RER_{j,d1}$ is the real exchange rate of country *j* (*d1* indicates definition 1), P^{NT} and P^{T} are, respectively, the domestic price indexes of nontradable and tradable goods

$$RER_{j,d1} = \frac{P_j^{NT}}{P_j^{T}} \quad . \tag{1}$$

- Second, as the ratio of domestic prices to foreign prices (usually the consumer price index). In equation (2) below, $RER_{j,d2}$ denotes the second definition of the real exchange rate of country *j*. CPI_j and E_j denote, respectively, the consumer price index and (an index of) the nominal exchange rate (measured in foreign currency per unit of domestic currency). *P** denotes an index of foreign prices (measured in foreign currency). The index of foreign prices may be of a single country or of a group of countries (see for instance equation (3) in the next section). Since this definition allows for a comparison of domestic and international prices over time, changes in this ratio indicate whether goods and services in the home country are becoming cheaper or more expensive than in other countries

$$RER_{j,d2} = \frac{CPI_j * E_j}{P*} \quad . \tag{2}$$

Real Exchange Rate Developments

Definition 1

5. **In the absence of official measures, developments in four alternative measures of definition 1 are presented below**. The measures use various proxies for the prices of nontradable and tradable goods.

6. **The *first measure* of the real exchange rate uses information on the disaggregated consumer price index (CPI) to classify each subgroup of the CPI as a tradable or a nontradable group** (there are between seven and eleven subgroups in each

country's CPI).[3] Price indexes for both the tradable and nontradable groups are constructed and the nontradable index is divided by the tradable index to obtain a measure of the real exchange rate.

7. **The *first measure* indicates that real exchange rates at end-June 2003, are, in general, more appreciated than in September of 1995—the start of the growth slow down in the region—although the degree varies from country to country** (Figure III.1). In Grenada, St. Kitts and Nevis, and St. Vincent and the Grenadines the real exchange rate appreciated by more than 15 percent. In contrast, in Antigua and Barbuda (where data are available only until December 2001), Dominica, and St. Lucia, real exchange rates were at levels comparable to those of the base period. The large appreciations observed in St. Kitts and Nevis and St. Vincent and the Grenadines are, to a large extent, associated with increases in housing prices.

8. **The *second measure* of the real exchange rate classifies all but food items as nontradable goods**. This measure avoids two disadvantages of the first measure, namely: uncertainty about the composition of each of the subgroups (for example, some tradable goods may be part of a subgroup that has been defined as nontradable), and lack of cross-country homogeneity at the subgroup level.

9. **The *second measure* portrays a similar picture to that indicated by the first measure, but the magnitudes of the appreciations are typically smaller** (Figure III.2). The only significant difference is the real exchange rate of St. Lucia, which appears slightly more appreciated under this measure when compared with the first measure.

10. **The *third measure* uses the CPI as the measure of the price of nontradable goods and the (weighted) unit prices of exports and imports as the measure of the price of tradable goods.** This approach not only simplifies cross-country comparisons, but also refines the measure of tradable goods, because even highly tradable goods can have a large nontradable component given the importance of distribution costs (which is a nontradable

[3] Disaggregated CPI data were obtained from the ECCB for each of the six Fund members of the ECCU, at quarterly frequency for the period 1990:01–2003:02 (data for Antigua and Barbuda were only available for the period 1994:01–2001:04 while data for Dominica start at 1994:01). The typical disaggregation contains the following subgroups, some of which were classified as tradables (food and beverages, clothing and footwear, and furniture and household appliances) and some as nontradables (housing, medical care and health, transportation, education, entertainment and recreation). In 2001, most countries modified the subgroups of the CPI (in most cases to increase the level of disaggregation of some subgroups). The analysis is based on the pre-2001 subgroups and, where necessary, the new subgroups were collapsed into the old ones using their corresponding weights, in order to guarantee homogeneous components throughout the period.

service).[4] While consumer price indexes are readily available for the ECCU countries, unit price measures for exports and imports are not, and were estimated using data on global commodity prices and data on the composition of each country's trade.

11. **The *third measure* shows a modest appreciation in the initial years and a substantial one in later years.** During 1990 to 1996 there is a 12 percent appreciation of the real exchange rate, while during 1997 to 2002 there is a 31 percent appreciation (Figure III.3). Overall, the ECCU index indicates a real exchange appreciation of 46 percent from 1990 to 2002, including a 2 percent depreciation in 2002. The estimates for individual countries were broadly similar, though a more substantial appreciation than the ECCU average is visible for St. Lucia and St. Kitts and Nevis.

12. **The *fourth measure* of the real exchange rate is based on sectoral GDP deflators.** The tradable goods deflator is calculated by adding GDP in current prices of the agriculture sector to GDP in current prices of the manufacturing sector, and dividing this amount by the sum of the corresponding GDP in constant prices. The nontradable goods deflator is calculated similarly by using GDP that excludes the agriculture and manufacturing sectors.[5] As a means to test the efficacy of purchasing power parity as a theory of exchange rate determination, this definition of prices is favored on theoretical grounds (Goldstein and Officer, 1979). In addition, GDP-based indexes are measures based on production rather than consumption, which is of key importance in considering country competitiveness issues.[6] Moreover, the GDP-based measures of the real exchange rate are also current-weighted price indexes, accounting for the changing pattern of sectoral production over time.

13. **The *fourth measure* shows that the largest appreciation occurred in St. Kitts and Nevis and the least in Antigua and Barbuda and Dominica** (Figure III.4). The appreciation in St. Kitts and Nevis has been primarily associated with a sustained rise in the relative price of nontradables, consistent with the findings related to the first measure. The

[4] The margins of the distribution sector, and with them the final price of the goods, will vary in the same direction as the price of nontradable goods, given that the distribution sector is a nontradable service. As a consequence, the final price of tradable and nontradable goods may behave very similarly when the distribution costs of the tradable goods are large.

[5] The current and constant price measures of sectoral GDP were obtained from the ECCB for each of the eight members of the ECCU, at annual frequency, for the period 1990–2002.

[6] While the consumer price index focuses on *domestic consumption* (it includes import prices but excludes export prices), the GDP deflator focuses on *domestic production* (it includes export prices but excludes import prices).

GDP-weighted ECCU index indicates about a 6 percent real appreciation over the 1990–2002 period, with the appreciation peaking in 1998 at about 9 percent above its 1990 level.[7]

Definition 2

14. **The traditional IMF measure of the real effective exchange rate, a version of equation (2), uses a weighted average of foreign prices (with the weights reflecting the home country's bilateral trade with each country)**. As mentioned above, the advantage of this definition is that it allows for a comparison of domestic and international prices over time.

15. **Definition 2 confirms a similar picture for all countries: an appreciation during the 1990s and a depreciation beginning in 2002** (Figure III.5).[8] The appreciation was most pronounced in St. Lucia and least pronounced in Antigua and Barbuda. A comparison of this measure with movements in the U.S. real exchange rate reveals the substantial influence of the latter on the former. A recent example is the real depreciation of the Eastern Caribbean (EC) dollar since early 2002, which has been associated with a sharp depreciation of the U.S. dollar against major currencies, particularly in the latter part of 2002.

Regularities Across Real Exchange Rate Measures

16. **The largest appreciation of the real exchange rates occurred in St. Kitts and Nevis and St. Vincent and the Grenadines**. All five measures of the real exchange rate provide evidence of large appreciations since 1990.

17. **Antigua and Barbuda and Dominica appear to have experienced the least appreciation of their real exchange rates**. Of the real exchange rate measures, these two countries indicate a large appreciation by one measure only.

18. **Evidence on real exchange rates in Grenada and St. Lucia are mixed, depending on the measure used.** Grenada's real exchange rate appreciated based on three measures but not the remaining two, while St. Lucia's real exchange rate appreciated based on only two measures.

---

[7] For this measure, the ECCU average includes Anguilla and Montserrat. The exclusion of these two countries, however, would not change the results much, given their small size relative to the other ECCU countries.

[8] Data on the real effective exchange rate of the six Fund members of the ECCU were taken from the Fund's *Information Notice System* (INS) database, at monthly frequency, for the period January 1990 to September 2003. The INS' monthly data are calculated by interpolating the quarterly CPI data supplied by the ECCB (and monthly nominal exchange rate data). Data for Antigua and Barbuda for 2002 and 2003 are estimates (provided by the database), as the ECCB has not reported CPI data for that country beyond December of 2001.

19. **The traditional IMF measure of the real exchange rate indicates that current real exchange rate levels are at par with historical levels**. However, a more detailed assessment based on the fundamental determinants is needed to determine the degree of undervaluation or overvaluation of the EC dollar.

20. **The exchange rate of the EC dollar appears to be close to its long-run equilibrium level, based on estimates that take into account the fundamental determinants of real exchange rates (Box III.1).** The recent depreciation of the U.S. dollar against major currencies has contributed to a real depreciation of the EC dollar (through the peg the EC dollar has to the U.S. dollar). The empirical analysis suggests that the real depreciation of the EC dollar has reversed the real appreciation of the currency that occurred during the period 1998–2001.

C. Real Exchange Rates Based on Customers and Competitors of the Tourism Sector

21. **For the analysis in this section, real exchange rate measures based on currencies of tourism customer and tourism competitor countries were constructed.** These measures are variants of the traditional real effective exchange rate index calculated by the IMF. The index is presented in equation (3), where RER_j denotes the real exchange rate of country j; CPI_j and E_j denote, respectively, the consumer price index and (an index of) the nominal exchange rate (measured in U.S. dollars per unit of domestic currency) of country j; and w_i denotes the weight assigned to each of the partner countries i. It can be seen that when domestic prices (measured in U.S. dollars) increase more than prices in partner countries, the real exchange rate will increase and the domestic currency will appreciate. Similarly, a depreciation occurs when domestic prices (measured in U.S. dollars) fall more in the domestic country than in partner countries.

$$RER_j = \frac{\left(CPI_j * E_j\right)}{\exp\left(\sum_{i=1}^{n}\left(w_i * \ln\left(CPI_i * E_i\right)\right)\right)} * 100 \qquad (3)$$

Box III.1. The Long-Run (Equilibrium) Real Exchange Rate of the EC Dollar

Comparing the ECCU's real exchange rate with only its historical values to determine the equilibrium exchange rate does not take account of recent macroeconomic shocks that have impacted the region. Therefore, it is important to explore whether or not the current real exchange rate of the EC dollar is consistent with the behavior of its fundamental determinants. Johansen's method can be used to investigate the existence of a long-run, cointegrating, relationship between the real exchange rate and a set of fundamentals—terms of trade, net foreign liabilities (proxied by public sector external debt), and size of the government (measured as the ratio of government expenditure to GDP). Economic theory suggests that these fundamentals affect the real exchange rate by raising the price of nontradable (NT) goods relative to tradable (T) goods, with increases (declines) in the NT to T ratio producing an appreciation (depreciation) of the real exchange rate. More specifically, an increase (decline) in the terms of trade or a decline (increase) in net foreign liabilities increases (reduces) an economy's wealth, and puts upward (downward) pressure on the price of NT relative to T due to the more limited supply of NT goods. Higher (lower) government spending usually increases (reduces) the price of NT goods, as government spending tends to be biased toward NT goods.

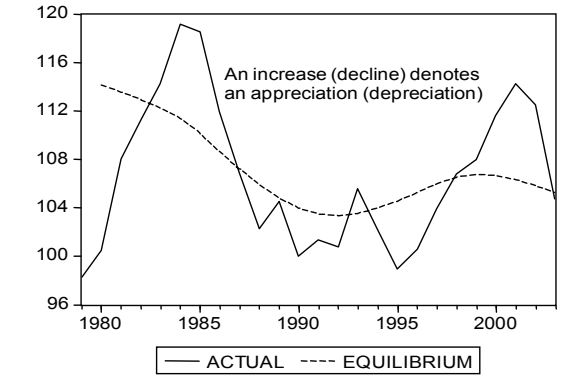
Given that the EC dollar is a regional currency, regional aggregates are used in estimating the equilibrium real exchange rate, which are weighted by GDP. Data are annual and cover the period 1979–2003. The analysis suggests that a cointegrating (long-run) relationship exists between the real exchange rate and its fundamental determinants, and the signs of the coefficients are consistent with economic theory. The estimated coefficients and the trend component of the fundamentals (derived using the Hodrick-Prescott filter) are then used to generate an estimate of the equilibrium real exchange rate.

The cointegrating equation obtained for the ECCU's real effective exchange rate (reer) is presented below (LN denotes natural log). The estimated coefficients in the equation below are semi-elasticities for government size and net foreign liabilities (both are measured in percent of GDP) and an elasticity for the terms of trade:

$LN(reer_t) = 2.40 + 1.39*LN(tot_t) + 0.07*(\text{government size}_t) - 0.015*(\text{net foreign liabilities}_t)$.

The estimation suggests (see Figure) that the EC dollar went through a period of overvaluation that started in 1998. The recent depreciation of the U.S. dollar against major currencies, and its impact on the real value of the EC dollar (through the EC dollar's peg to the U.S. dollar) seems to have corrected the previous overvaluation since, as of 2003, the actual real exchange rate is very close to its equilibrium level. A caveat to the analysis is that the long-run determinants of the equilibrium real exchange rate vary from country to country, and for some ECCU countries no long-run relationship was found. However, the results presented serve as an indication of the situation in the region as a whole.

ECCU. Actual and Equilibrium Real Exchange Rates (Indexes, 1990=100)



Tourism Customer-Based Real Exchange Rates

22. **The customer-based real exchange rate indicates in general that the rate has been fairly stable since 1990** (Figure III.6). Partner countries considered are the three main customers of each country's tourism sector (Table III.2). While the exchange rate for the region as a whole remained fairly stable, there are several country-specific results that are worth noting. First, Antigua and Barbuda and Dominica have become marginally cheaper destinations for their major customers since 1990, although the change is only around 5 percent for the period 1990–2003. Second, Grenada and St. Vincent and the Grenadines have also experienced a depreciation of their customer-based real exchange rates, especially since 1993. This depreciation has been mainly driven by a sustained appreciation of the real exchange rate of Trinidad and Tobago, a key tourism customer of both countries. Third, and in contrast to the other countries, St. Kitts and Nevis and St. Lucia have become more expensive than they were in 1990. The extent of their appreciations is moderate, however, ranging from around 8 percent for St. Kitts and Nevis to around 2 percent for St. Lucia.

23. **A common phenomenon for all ECCU countries is the continued real depreciation of the customer-based real exchange rates in 2002–03.** The main factor underpinning this behavior is the depreciation of the U.S. dollar against other major currencies (for these indexes the relevant currencies are the Canadian dollar, the Euro, and the U.K. pound).

Tourism Competitor-Based Real Exchange Rates

24. **On average, the competitor-based real exchange rates depreciated during the 1990s, a trend that was reversed in 2002-03 because of the large real depreciation of the Dominican Republic's peso** (Figure III.7). The competitor-based real exchange rate indexes were constructed using the following countries and weights: The Bahamas (23.4 %), Barbados (8.0 %), Dominican Republic (43.5 %), Jamaica (19.4 %), and Trinidad and Tobago (5.7 %). The weights were chosen based on their relative size (tourism arrivals) in the tourism market in the Caribbean in 2001.

25. **The ECCU countries' bilateral real exchange rates with The Bahamas, a country with a large share of Caribbean tourism, have depreciated on average since 1990** (Figure III.8). The Bahamas is a good example of a close competitor to the ECCU, as it is a country with a large share of tourism in the Caribbean, and whose market segment is similar to that of the ECCU (the high-income or upper-end segment). In addition, like the ECCU, its nominal exchange rate has been pegged to the U.S. dollar throughout the period, so that real exchange rate movements can be calculated on the basis of changes in relative prices. As of 2003, only St. Kitts and Nevis has experienced an appreciation of its Bahamas-based real exchange rate, while the real exchange rates of other ECCU countries have depreciated. However, the appreciation in St. Kitts and Nevis was moderate, at around 5 percent with respect to 1990. Antigua and Barbuda, Dominica, Grenada, and St. Vincent and the Grenadines have all experienced depreciations of their Bahamas-based real exchange

rate with respect to the rates prevailing in 1990. The depreciations in the other countries range from around 3 percent in Grenada to around 7 percent in the remaining three countries.

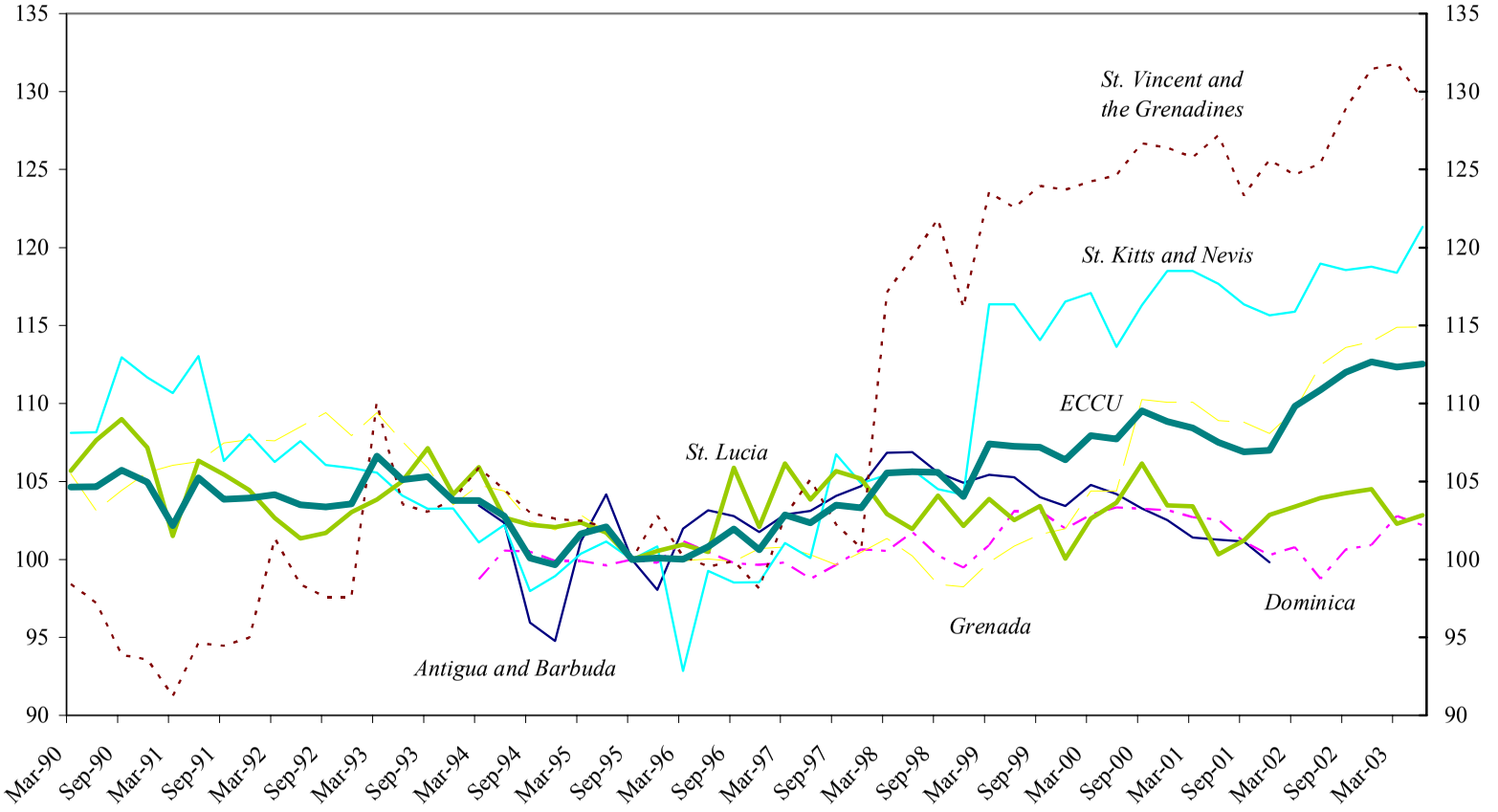
D. Conclusions

26. **The real exchange rates of ECCU countries are (as of September 2003) at about the same level that they were in 1990.** At a country-specific level, only St. Kitts and Nevis appears to have lost competitiveness, although the loss is moderate. Antigua and Barbuda and Dominica consistently seem to have gained competitiveness, although the gains also look moderate.

27. **At the regional level the ECCU countries are facing two shocks: the depreciation of the U.S. dollar and the depreciation of the Dominican Republic's peso.** The first shock is increasing the attractiveness of ECCU countries to their customers, especially Canada and Europe, while the second is making it more difficult for ECCU countries to compete (on the basis of price) in the tourism market.

28. **An analysis of the fundamental determinants of the ECCU equilibrium real exchange rate indicates that the real exchange rate of the EC dollar is neither over- nor undervalued.** The empirical analysis suggests that the recent real depreciation of the EC dollar has corrected the real appreciation that occurred during 1998–2001.

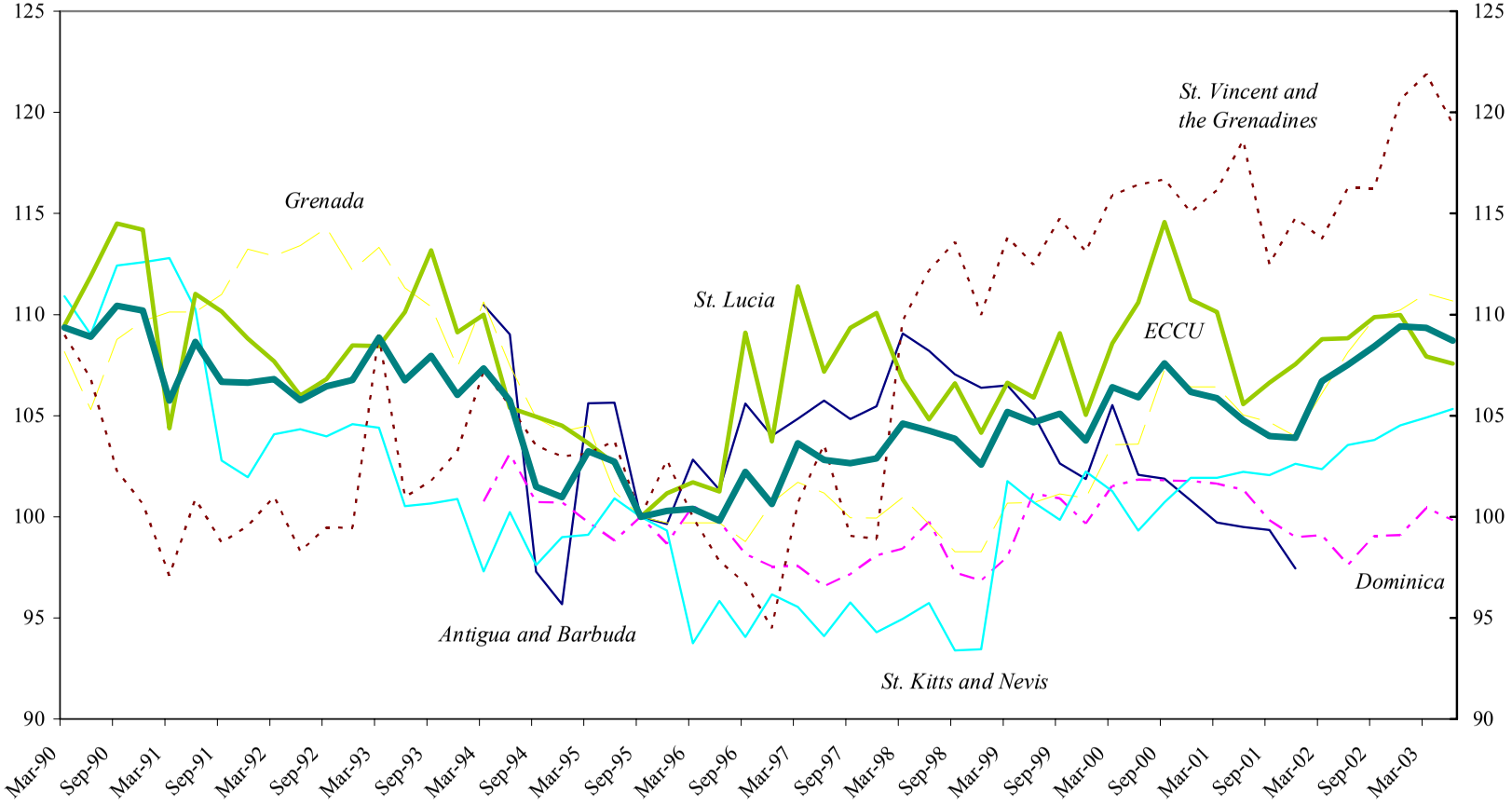
Figure III.1. ECCU: Real Exchange Rates—Based on Disaggregated Consumer Price Index, 1990–2003 1/
(September 1995=100)



Source: Fund staff calculations using data from the Eastern Caribbean Central Bank.

1/ Calculated as the country-specific price index of nontradable consumer goods divided by the country-specific consumer price index of tradable goods. An increase (decrease) indicates an appreciation (depreciation). Excludes Anguilla and Montserrat in the calculation of the ECCU average. ECCU average excludes Antigua and Barbuda and Dominica before March of 1994 and Antigua and Barbuda after December of 2001. Data up to June 2003 for all countries except Antigua and Barbuda which has data up to December 2001.

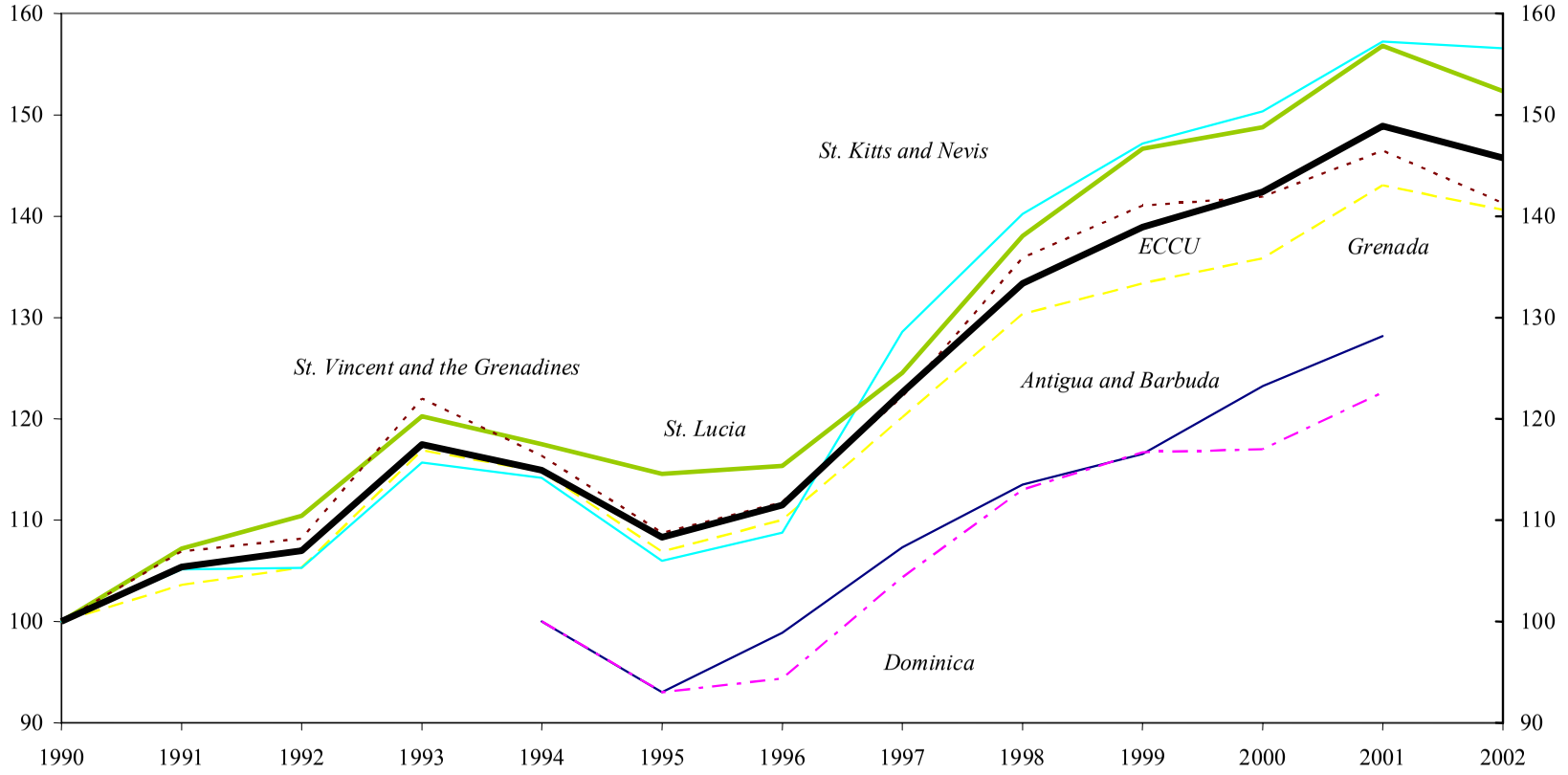
Figure III.2. ECCU: Real Exchange Rates—Non-Food and Food Price Indexes, 1990–2003 1/
(Sep. 1995=100)



Source: Fund staff calculations using data from the Eastern Caribbean Central Bank.

1/ Calculated as the price index of non-food consumer goods divided by the price index of food. An increase (decrease) indicates an appreciation (depreciation). Excludes Anguilla and Montserrat in the calculation of the ECCU average. ECCU average excludes Antigua and Barbuda and Dominica before March of 1994 and Antigua and Barbuda after December of 2001. Data up to June 2003 for all countries except Antigua and Barbuda which has data up to December 2001.

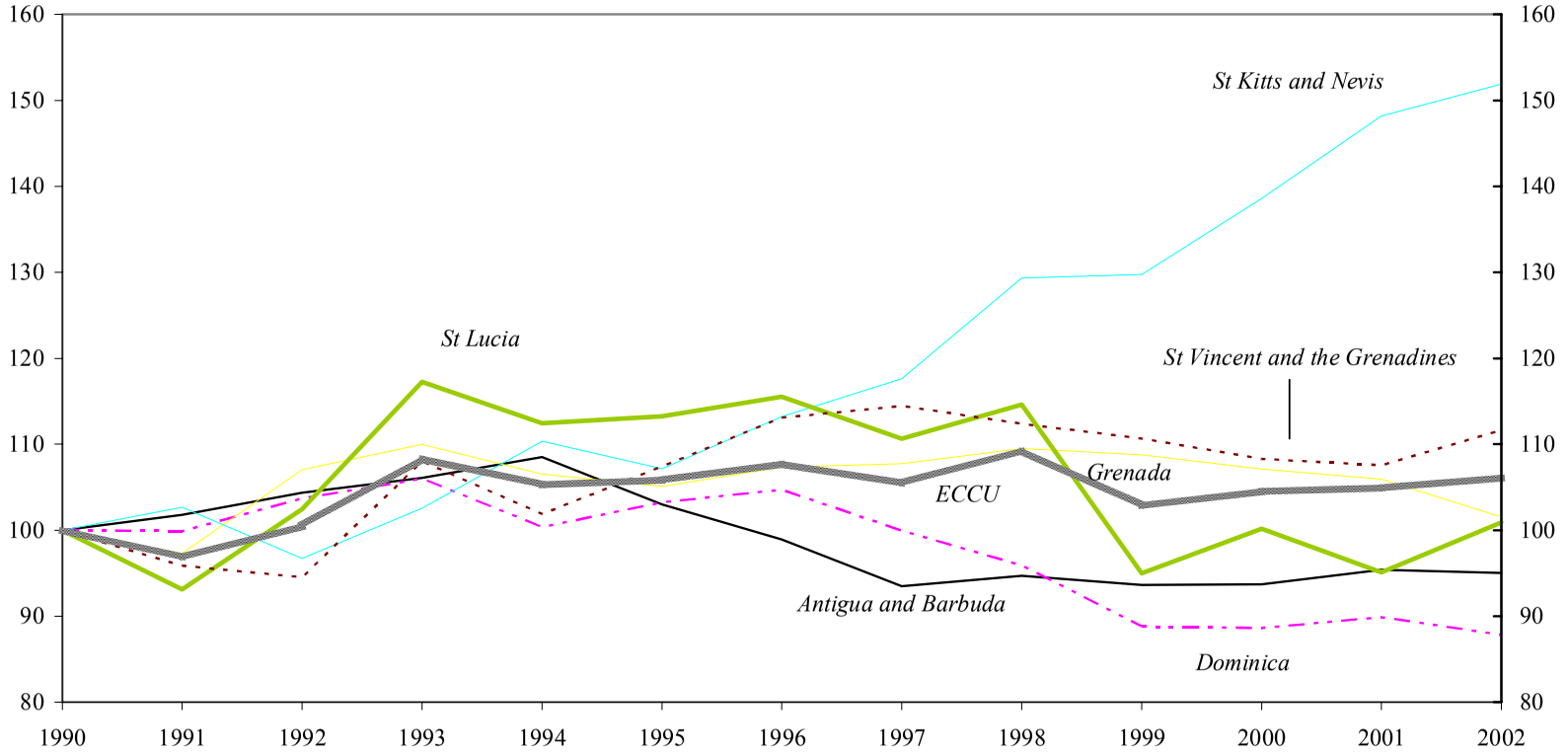
Figure III.3. ECCU: Trade-Based Measure of the Real Exchange Rate, 1990–2002 1/
(1990=100)



Source: Eastern Caribbean Central Bank and Fund staff estimates.

1/ Calculated as the consumer price index divided by a weighted index of the unit value indexes for imports and exports. An increase (decrease) indicates an appreciation (depreciation). Excludes Anguilla and Montserrat in the calculation of the ECCU average. The indexes are set at 1990=100 for all series, except for Grenada and Antigua and Barbuda, whose series are set at 1994=100.

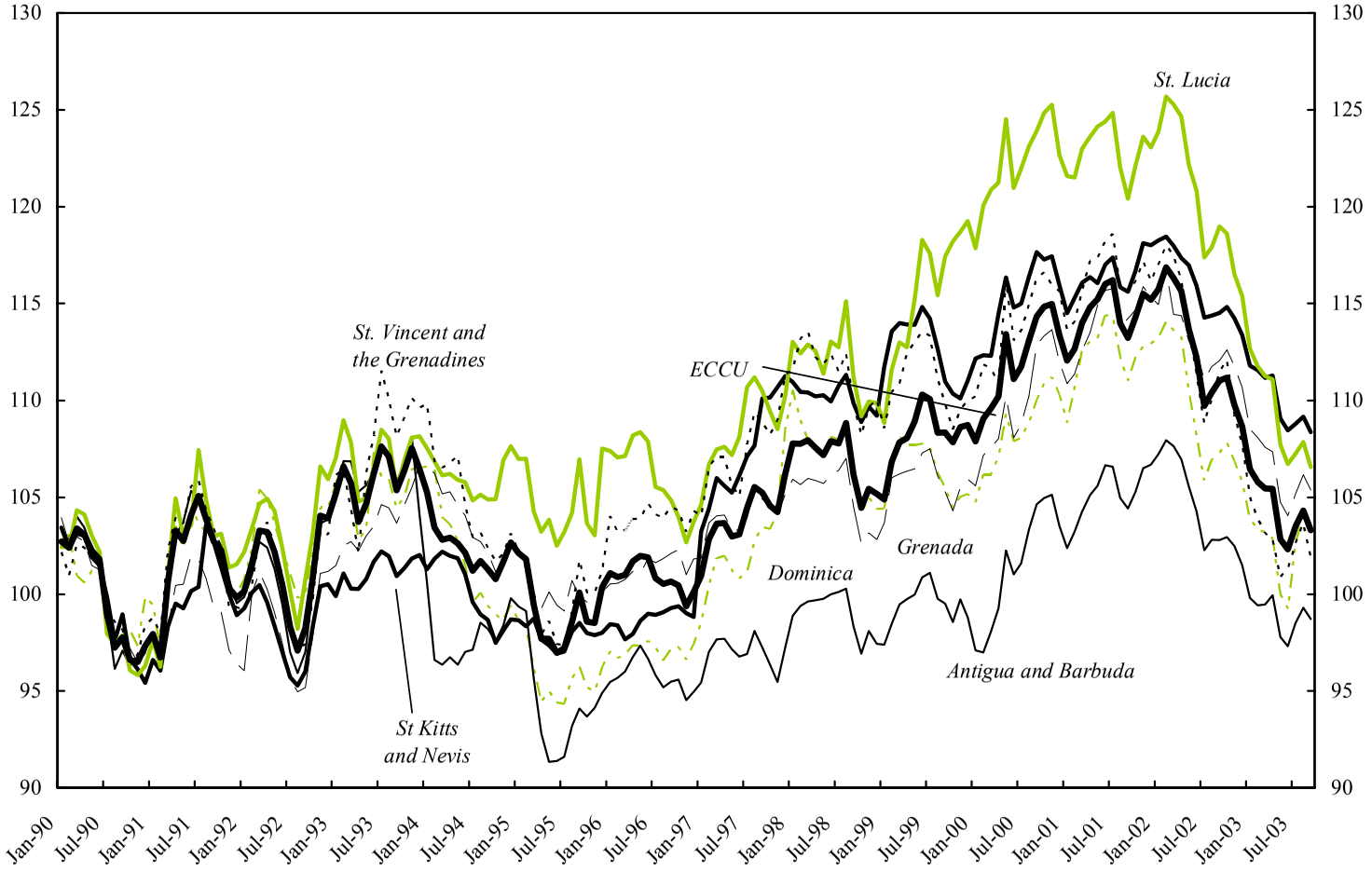
Figure III.4. ECCU: Real Exchange Rates—Based on Sectoral GDP Deflator for Nontradables and Tradables, 1990–2002 1/
(1990=100)



Source: Eastern Caribbean Central Bank and Fund staff estimates

1/ Real exchange rate is measured as the price of nontradables relative to the price of tradables. An increase (decrease) indicates and appreciation (depreciation). Tradable sectors include agriculture and manufacturing; nontradable sectors include mining and quarrying and all service sectors.

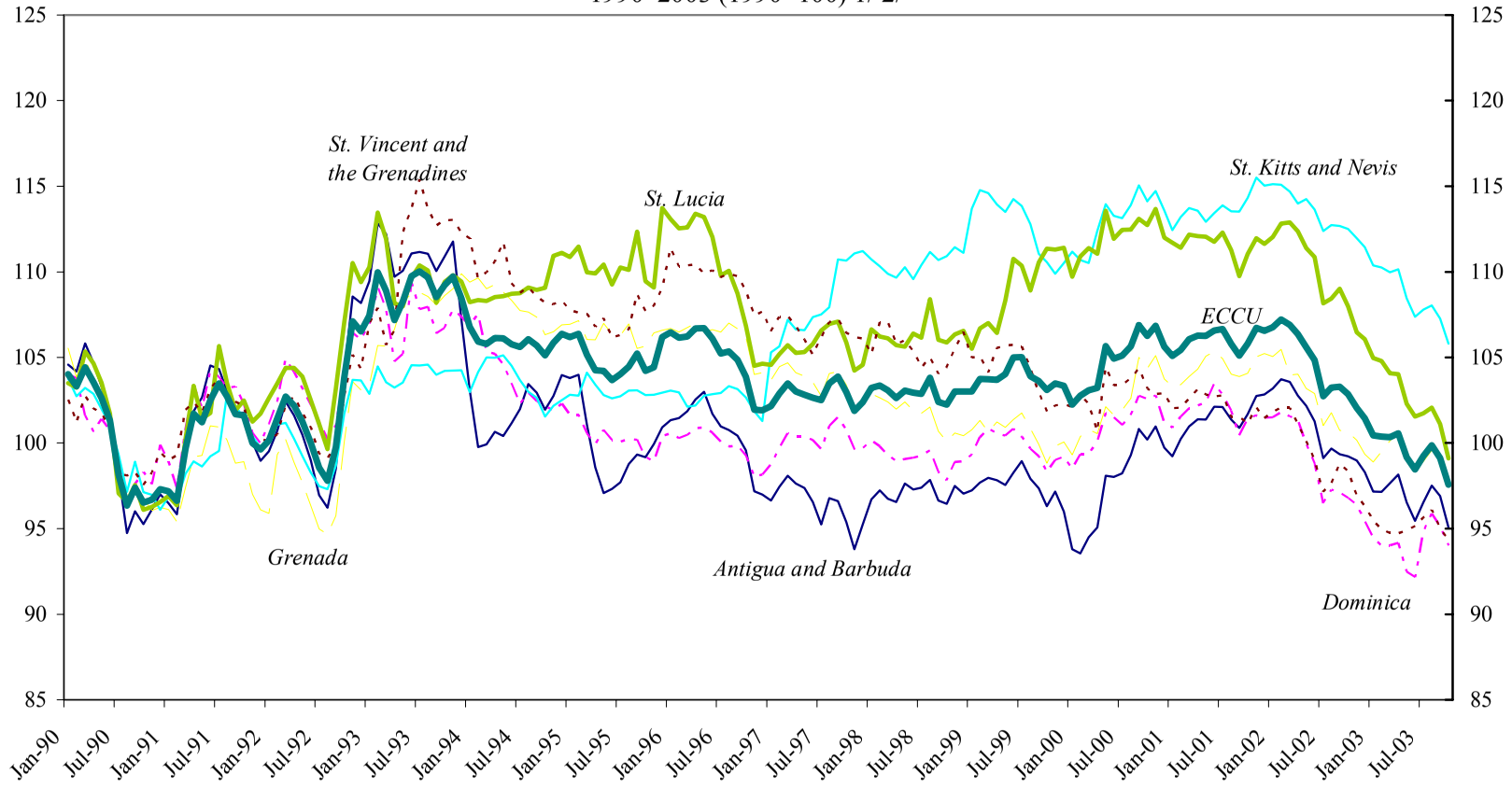
Figure III.5. ECCU: Real Exchange Rate—Real Effective Exchange Rate, 1990–2003 1/
(1990=100)



Sources: IMF Information Notice System; and Fund staff estimates.

1/ Trade-weighted index of nominal exchange rates deflated by seasonally adjusted relative consumer prices. An increase (decrease) indicates an appreciation (depreciation). Excludes Anguilla and Montserrat in the calculation of the ECCU average. Data up to September 2003 for all countries.

Figure III.6. ECCU: Real Exchange Rates With Respect to Main Customers of the Tourism Sector, 1990–2003 (1990=100) 1/ 2/

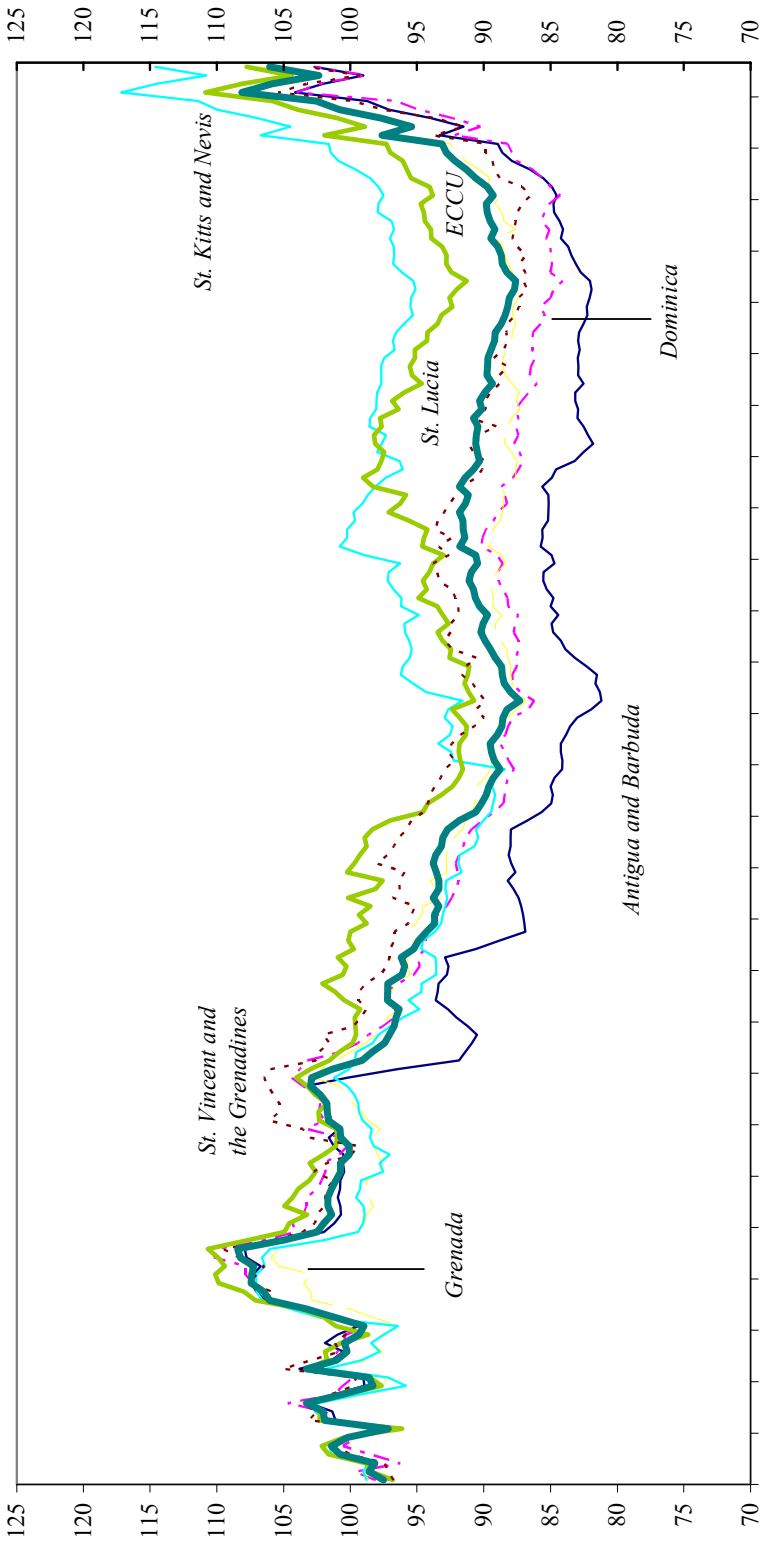


Sources: IMF Information Notice System; and Fund staff estimates.

1/ Customers-weighted index of nominal exchange rates deflated by seasonally adjusted relative consumer prices. An increase (decrease) indicates an appreciation (depreciation). Excludes Anguilla and Montserrat in the calculation of the ECCU average. Data up to October 2003 for all countries.

2/ Customers: Antigua and Barbuda-(Canada, UK, US), Dominica-(France, UK, US), Grenada-(Trinidad and Tobago, UK, US), St. Kits and Nevis-(Canada, U.K., U.S.), St. Lucia-(Canada, U.K., U.S.), St. Vincent and the Grenadines-(Trinidad and Tobago, U.K., U.S.).

Figure III.7. ECCU: Real Exchange Rates With Respect to Tourism Competitors, 1990–2003 1/ 2/
(1990=100)

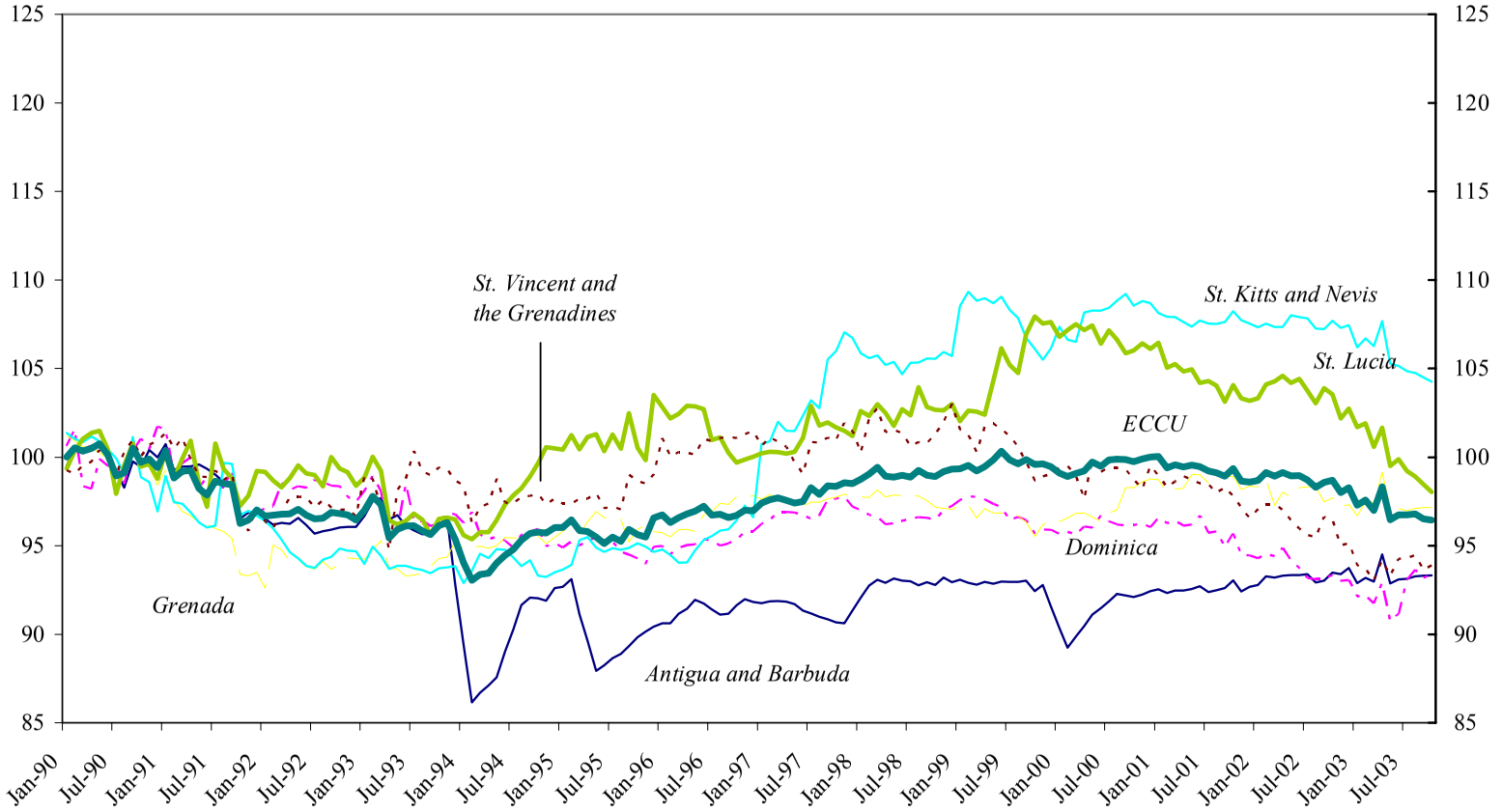


Sources: IMF Information Notice System; and Fund staff estimates.

1/ Competitors-weighted index of nominal exchange rates deflated by seasonally adjusted relative consumer prices. An increase (decrease) indicates an appreciation (depreciation). Excludes Anguilla and Montserrat in the calculation of the ECCU average. Data up to October 2003 for all countries.

2/The competitors with their respective weights in the index are: The Bahamas (23.4 %), Barbados (8.0 %), Dominican Republic (43.5 %), Jamaica (19.4 %), and Trinidad and Tobago (5.7 %). The weights are chosen based on the share of tourism arrivals to the Caribbean in 2001.

Figure III.8. ECCU: Real Exchange Rates With Respect to The Bahamas, 1990–2003 1/
(1990=100)



Sources: IMF Information Notice System; and Fund staff estimates.

1/ Index of nominal exchange rates deflated by seasonally adjusted relative consumer prices. An increase (decrease) indicates an appreciation (depreciation). Excludes Anguilla and Montserrat in the calculation of the ECCU average. Data up to October 2003 for all countries.

Table III.1. Selected Caribbean Market Share Indicators 1/ 2/

(Figures are expressed as ratios to the respective Caribbean totals)

Destination	1990	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average	Change 1995–97 2/	Change 1998–2002
Stayover tourist arrivals													
CARICOM	31.3	27.8	27.2	26.4	25.8	25.4	24.6	24.6	25.5	27.1	25.2	-1.4	-0.4
ECCU	5.4	5.0	4.9	4.9	4.8	4.7	4.4	4.4	4.6	4.9	4.6	-0.2	-0.2
Non-ECCU	25.9	22.7	22.3	21.5	21.0	20.7	20.2	20.3	20.8	22.2	20.6	-1.2	-0.2
Other	68.7	72.2	72.8	73.6	74.2	74.6	75.4	75.4	74.5	72.9	74.8	1.4	0.4
Cruise passenger arrivals													
CARICOM	50.7	37.3	36.2	34.9	35.2	37.7	39.1	38.0	35.9	36.1	37.2	-2.4	0.7
ECCU	9.8	10.1	9.7	10.0	11.3	10.8	10.7	10.7	7.5	9.9	10.2	-0.1	-3.8
Non-ECCU	40.9	27.2	26.5	24.9	23.9	26.9	28.4	27.4	28.4	26.2	27.0	-2.3	4.6
Other	49.3	62.7	63.8	65.1	64.8	62.3	60.9	62.0	64.1	63.9	62.8	2.4	-0.7
Estimates of visitor expenditure													
CARICOM	35.2	28.9	28.0	27.2	26.1	26.3	25.8	25.4	26.3	28.1	26.0	-1.7	0.2
ECCU	6.8	5.6	5.3	5.4	5.2	4.9	4.5	4.8	4.8	5.5	4.8	-0.3	-0.4
Non-ECCU	28.4	23.3	22.7	21.8	20.9	21.4	21.3	20.6	21.5	22.6	21.2		
Other	64.8	71.1	72.0	72.8	73.9	73.7	74.2	74.6	73.7	71.9	74.0	1.7	-0.2
Rooms in tourist accommodation													
CARICOM	58.1	30.6	29.9	28.8	28.1	27.9	27.4	27.2	27.1	28.8	28.2	-1.8	-1.0
ECCU	8.7	7.0	6.4	6.1	6.0	5.8	6.0	5.8	5.4	6.2	6.0	-0.9	-0.6
Non-ECCU	49.3	23.6	23.6	22.7	22.1	22.2	21.4	21.4	21.7	22.6	22.2	-0.9	-0.4
Other	41.9	69.4	70.1	71.2	71.9	72.1	72.6	72.8	72.9	71.2	71.8	1.8	1.0

Source: Caribbean Tourism Organization.

1/ 'CARICOM' refers to English-Speaking, traditional CARICOM members.
2/ The 1990 column is only indicative, since the data for key "Other Caribbean countries" (such as Cancun/Mexico, Cozumel/Mexico, the Dominican Republic, and Puerto Rico) is not available.

Table III.2 ECCU: Major Customers of the Tourism Sector

Host	Customers 1/	Shares in Index (%)
Antigua and Barbuda	Canada, United Kingdom, United States	9.1, 48.2, 42.8
Dominica	France, United Kingdom, United States	11.5, 25.9, 62.6
Grenada	Trinidad and Tobago, United Kingdom, United States	18.3, 38.4, 43.4
St. Kitts and Nevis	Canada, United Kingdom, United States	13.2, 22.1, 64.6
St. Lucia	Canada, United Kingdom, United States	7.2, 39.3, 53.5
St. Vincent and the Grenadines	Trinidad and Tobago, United Kingdom, United States	19.9, 28.7, 51.4

Source: Caribbean Tourism Organization.

1/ Denotes major customers of each ECCU country in 2001.

References

Goldstein, M., and L. Officer, 1979, "New Measures of Prices and Productivity for Traded and Nontraded Goods," *Review of Income and Wealth*, Vol. 25, No. 4.

International Monetary Fund, 2003, "Tourism in the Eastern Caribbean: Meeting the Competitive Threat," in *Eastern Caribbean Currency Union: Selected Issues*, Prepared by Anthony Boote and others, International Monetary Fund, Washington, D.C.

IV. Eastern Caribbean Tourism: Developments and Outlook[1]

A. Introduction

1. **Tourism contributes significantly to GDP, public finances, and the balance of payments in the countries of the Eastern Caribbean Currency Union (ECCU).** During 1990–2002, the co-movement between real economic growth and the growth in stay-over tourist arrivals and tourism receipts in the ECCU was nearly 80 percent and 75 percent, respectively, reflecting the strength of the underlying sectoral linkages.[2] In the aftermath of the September 11 terrorists attacks, tourism to the Caribbean contracted sharply, and the ECCU suffered an unprecedented decline in output (a fall of 1.5 percent) in 2001, an increase in unemployment, and a sharp deterioration in its fiscal position (the central government deficit widened from 5½ percent of GDP in 2000 to around 7 percent of GDP in 2001).

2. **There are several channels through which tourism affects real economic activity, public finances, and the balance of payments.** The *direct effect* results from the provision of hotel and restaurant services, recreation and entertainment, transportation, and retail trade. The *indirect effect* emanates from economic activity related to suppliers' provision of inputs (including raw materials and energy) to hotels and restaurants, and other retailers. Finally, there are also *second-round effects* on economic activity from the spending of household disposable income derived from either the direct or indirect effects.[3]

3. **While detailed studies for all ECCU countries are not available, a study on St. Lucia provides an example of the economic contribution of tourism**. According to a study conducted by the Caribbean Tourism Organization (CTO) in 1998, each EC dollar spent on tourism in St. Lucia generated EC$0.65 in income (64 percent through the direct effect, 23 percent through the indirect effect, and 13 percent through second-round effects).[4] Tourists' expenditures accounted for nearly 30 percent of GDP, about 20 percent of all St. Lucian jobs, and 20 percent of total government revenue. Visitor expenditures accounted for over 70 percent of St. Lucia's exports of goods and services, suggesting a high level of

---

[1] Prepared by Ruby Randall. This chapter builds on an earlier paper prepared by Wendell Samuel and Ruby Randall in IMF Country Report No. 03/88, *Eastern Caribbean Currency Union—Selected Issues*, entitled "Tourism in the Eastern Caribbean: Meeting the Competitive Threat."

[2] As measured by the correlation coefficient.

[3] A thorough analysis of tourism's direct, indirect and second-round effects on the ECCU region would constitute a major undertaking that is outside the scope of this study.

[4] Information obtained from the CTO's Tourism Economic Impact Analysis Project Draft Report, entitled "St. Lucia: Economic Impact of Visitor Expenditure—1998," August 25, 2000.

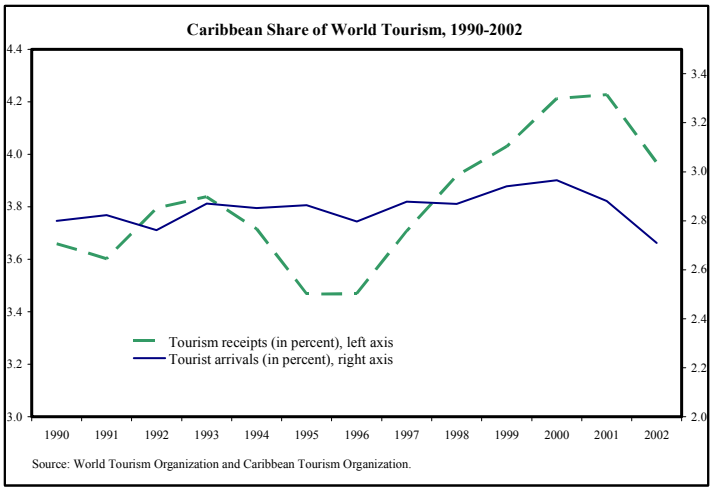
dependency of foreign exchange earnings on tourism. However, the revenue leakage through tourism-related imports of goods and services is fairly substantial at more than double the amount of its contribution to government revenue.

4. **The rest of the chapter is structured as follows.** Section B analyzes recent developments in Caribbean tourism, with particular emphasis on the ECCU, from a global and regional perspective. Section C discusses the competitiveness of tourism in the Caribbean Community and Common Market (CARICOM)[5] and the ECCU. It also describes the short-term policy responses of CARICOM, and a proposed medium-term strategy for restructuring the industry. The concluding section offers some policy recommendations.

B. Recent Tourism Developments

Overview: Aggregate Tourism Trends in the Caribbean

5. **During the 1990s, there was uninterrupted growth in both Caribbean and world tourism.** Over the period 1990–1999 the Caribbean share of world tourist arrivals and tourism receipts increased, since average growth in Caribbean stay-over arrivals and tourism receipts outpaced the growth in world stay-over arrivals and tourism receipts (Table IV.1).



6. **The September 11, 2001 terrorist attacks in the United States had a pronounced deleterious effect on both world and Caribbean tourism, causing a contraction for the first time since 1990**. During the first eight months of 2001, world and Caribbean stay-over tourist arrivals grew by 3 and 2½ percent, respectively, relative to the same period in 2000 (Caribbean Tourism Organization, 2002a, 2002b, 2002c).[6] However, there was a sharp contraction of over 10 percent and nearly 17 percent in world and Caribbean tourism arrivals, respectively, during the last four months of the year (Table IV.2). With the decline in global stay-over

[5] CARICOM is comprised of the following member states: Antigua and Barbuda, The Bahamas (a member of the Community but not the Common Market), Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. CARICOM's Associate Members include: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, and Turks and Caicos Islands.

[6] Data refers specifically to stay-over tourist arrivals.

arrivals observed in 2001, the Caribbean share of world tourist arrivals declined marginally from 3 percent in 2000 to 2.9 percent (still slightly higher than the average over 1990–99), while the Caribbean's share of world tourism receipts was unchanged (at 4.2 percent) since world tourism receipts declined more sharply than Caribbean tourism receipts.

7. **Although world tourism rebounded in 2002, Caribbean stay-over arrivals and tourism receipts did not.** In 2002, world stay-over arrivals and receipts grew by 2.7 percent and 3.7 percent, respectively, while Caribbean tourism arrivals continued to contract (by 3.4 percent), although the decline in tourism receipts was less severe (a fall of 2.7 percent). As a result, the Caribbean's share of world tourist arrivals fell from 2.9 percent to 2.7 percent over 2000-01—a 12-year low—while the region's share of world tourism receipts fell from 4.2 to 4.0 percent (the 1999 level).

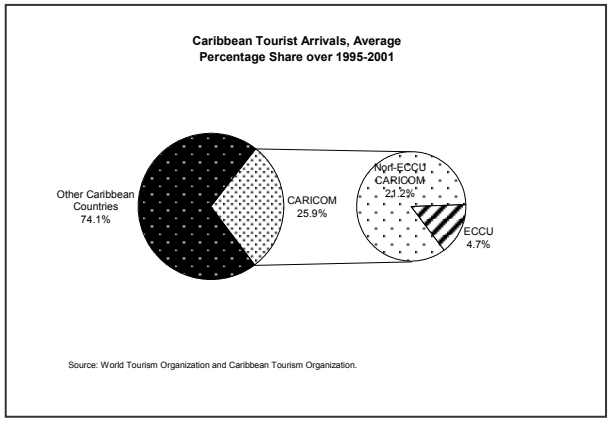
8. **During the 1990s, there was also a shift in the country origin of stay-over visitors to the Caribbean, with the share of visitors from the U.S. declining** (Table IV.3). The percentage share of visitors from the United States declined from nearly 60 percent in 1990 to 48 percent in 2002 owing to increased competition from various U.S. destinations, such as Florida and Hawaii. The share of European tourist arrivals was the second highest, and rose throughout much of the period from over 17 percent in 1990 to over 25 percent in 2002, partly reflecting the strength of the euro. The share of Canadian tourists declined initially, from 6.6 percent in 1990 through 1999, and then increased to 8.6 percent by 2002. Stay-over tourists originating in other countries (including elsewhere in the Caribbean) fluctuated somewhat during the period, and then stabilized at about 18 percent (Caribbean Tourism Organization, 2002a, 2002b, 2002c).

9. **During 1990–2001, the english-speaking CARICOM[7] lost world market share to newly emerging, lower-cost tourism destinations elsewhere in the Caribbean** (Table IV.4). CARICOM's world market share of tourist arrivals declined from 0.88 percent in 1990 to 0.69 percent in 2002, while that of "other (non-CARICOM) Caribbean destinations" rose sharply, from 0.78 percent in 1990 to 2.02 percent in 2002. Similarly, CARICOM's share of world tourism receipts declined from 1.29 percent in 1990 to 1.04 percent in 2002, while that of other Caribbean countries' rose from 2.37 in 1990 to 2.92 in 2002.

[7] Henceforth, the english-speaking Caribbean Common Market will simply be referred to as CARICOM. This region includes the Eastern Caribbean Currency Union.

Tourism Trends in the ECCU

10. **The ECCU represents less than 5 percent of total Caribbean stay-over arrivals.** CARICOM's share is about 26 percent, while "other Caribbean countries/destinations" account for the rest. During 1995–01, average annual stay-over arrivals to the ECCU region ranged from a high of 250,000 in St. Lucia to just 9,900 in Montserrat. By contrast, non-ECCU CARICOM and other Caribbean destinations received an average of 3.9 million stay-over visitors (21 percent of Caribbean stay-over arrivals) and 13.6 million visitors (74 percent of the Caribbean stay-over arrivals), respectively, during this period. Among the various destinations included in the sample, Puerto Rico was clearly the industry leader, with an annual average of 3.2 million stay-over visitors.



11. **During 1995–2001, ECCU and the rest of CARICOM had a much larger share of the cruise passenger tourist market in the Caribbean than the stay-over market**. On average, over the same period ECCU's average annual market share was 10½ percent, while non-ECCU CARICOM's share was nearly 27 percent.

12. **ECCU and other CARICOM countries catered to the high-end of the tourism market, and as such, during 1995–2001 the ECCU's share of visitor expenditures exceeded its share of tourist arrivals.** The ECCU received about 5 percent of average total receipts to the Caribbean (US$0.9 billion), while CARICOM as a whole received nearly 27 percent of average total Caribbean receipts (US$5.6 billion).

13. **There was a noticeable decline in the relative shares of CARICOM vis-à-vis other Caribbean destinations in three out of four tourism performance indicators over the period 1990 to 2001 (Table IV.5).** In particular, the decline in CARICOM's Caribbean share of stay-over arrivals, visitor expenditures,[8] and rooms in tourist accommodation suggests a reduction in CARICOM's competitiveness vis-à-vis the rest of the Caribbean. Moreover, in each case, the ECCU's shares exhibited a steady decline. CARICOM's share of Caribbean (stay-over) tourist arrivals declined, from about 31 percent in 1990 to less than 25 percent in 2001, and ECCU's share also fell, from 5.4 percent to 4.2 percent in 2001. Moreover, given that the average daily expenditures of stay-over tourists typically surpasses that of cruise passengers, the erosion of CARICOM's stay-over market share was also reflected in an erosion in CARICOM's market share of visitor expenditures, which declined

[8] Used interchangeably with tourism receipts.

from 35 percent in 1990 to 25 percent in 2001. Finally, consistent with the rapid expansion in the market share of "other Caribbean" stay-over visitors, this group's market share of tourist accommodations also rose rapidly, from 42 percent in 1990 to 73 percent in 2001. In 2002, CARICOM and ECCU regained some lost ground vis-à-vis "other Caribbean destinations" in all three indicators, and the ECCU's share either stabilized or increased. On the other hand, CARICOM's share in cruise ship tourism rose marginally during 1995–2000. The region's share rose from 37 percent to 39 percent, before declining again in 2001 and 2002.

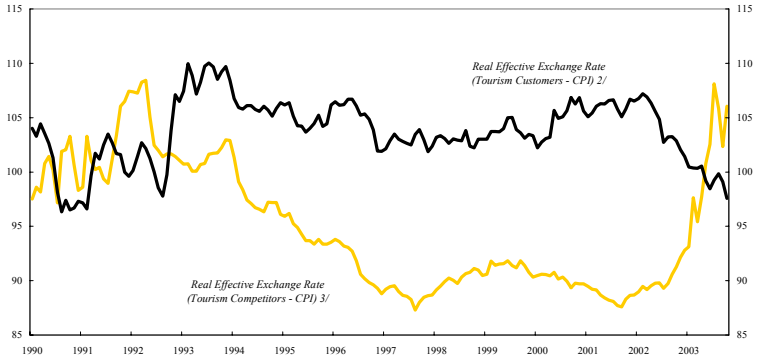
14. **Tourist arrivals to ECCU countries increased in 2002 despite the contraction in total Caribbean tourist arrivals; however, the ECCU's share of world tourist arrivals continued to decline.** Despite a 2.3 percent nominal increase in tourist arrivals to the ECCU, the growth in world tourist arrivals outstripped that of the ECCU, resulting in the decline in the ECCU's world share of tourist arrivals. The decline in the Caribbean aggregate was primarily due to a general (and in some cases fairly significant) decline in arrivals to "Other Caribbean Countries" (falling by 4.4 percent). Arrivals to non-ECCU CARICOM countries also declined, but fairly modestly (falling by 0.8 percent)[9].

C. Caribbean Tourism: Trends in Competitiveness

15. **The loss in CARICOM and ECCU market share to other Caribbean destinations during 1995–2001 can be associated with a decline in either price and/or nonprice competitiveness.** Nonprice factors include product design, packaging, quality of service, reliability of supplies, after-sales service, distribution networks, marketing and market intelligence, and air access.

16. **Movements in customer-based and competitor-based real effective exchange rates (REER) are key indicators of the ECCU region's price competitiveness—reflecting demand and supply-side factors, respectively.**[10] The

ECCU: Real Effective Exchange Rates (1990 = 100) 1/



1/ For real effective exchange rate indices. An increase (decrease) indicates an appreciation (depreciation). Excludes Anguilla and Montserrat in calculation of the ECCU average.
2/ Weighted average of CPI in a common currency. Customers: Antigua - (Canada, UK, USA); Dominica - (France, UK, USA); Grenada - (Trinidad and Tobago, UK, USA); St. Kitts - (Canada, UK, USA); St. Lucia - (Canada, UK, USA); St. Vincent - (Trinidad and Tobago, UK, USA). Weights are based on proportion of tourists arriving from each country in 2001.
3/ Weighted average of CPI in a common currency. Competitors: Bahamas (23.4%), Barbados (8.0%), Dominican Republic (43.5%), Jamaica (19.4%), Trinidad and Tobago (5.7%). Weights are based on the share of tourism arrivals to the Caribbean in 2000.

[9] For additional data on Caribbean tourism since 1990, see Appendix Tables IV.1–IV.8.

[10] The customer-based REER uses the weighted average of the consumer price indexes of the ECCU countries. Customers are the top three originating markets for each country, and weights are based on the proportion of tourists arriving from each country in 2001. The

(continued)

competitor-based REER index helps explain the loss of market shares since the late 1990s. It shows a sharp improvement in the ECCU's competitive position vis-à-vis other Caribbean competitors through much of 1997; followed by an appreciation that became quite pronounced from the second half of 2002. On the other hand, the customer-based REER is not useful in explaining the declining share of ECCU in world tourism since the latter half of the 1990s.

17. **The under-performance of the ECCU in 1995–99, which is not explained by customer-based real effective exchange rates, suggests the possible dominance of nonprice factors or the rigidity of tourism-related products priced in U.S. dollars.** In fact, the depreciation of the Eastern Caribbean dollar vis-à-vis its competitors did not translate into a decline in several key factors such as cost of vacation packages, car rental prices, and long-distance telecommunication charges. The role of industry-specific price and nonprice factors is further explored in the sections that follow.

Industry-Specific Price Competitiveness: Demand-Side Factors

18. **The ECCU and other CARICOM destinations are characterized by higher tourism-related prices, reflecting their appeal to the high-end of the tourism market.** Figure IV.1 provides a comparison of various competitiveness indicators for different Caribbean destinations. These include average European vacation package prices for 4–5 star resorts (Panel 1); average all-inclusive vacation package prices for 4–5 star resorts (Panel 2); rental mid-size car weekly rentals (Panel 3); and nightly hotel room rates at the "100 Top Caribbean Resorts" (Panel 4). The data confirm that, for these indicators, prices in ECCU countries tend to be among the highest in the Caribbean. For instance, six out of eight of the costliest European vacation packages were found in ECCU countries, and the most costly European vacation packages were found in Anguilla (also an ECCU member state). The ECCU median price for European vacation packages was US$2,170, while the non-ECCU median was US$1,623. In addition, ECCU member states accounted for 4 out of 7 of the costliest all-inclusive 4–5 star resorts; the ECCU median price was US$2,282, while the non-ECCU median was US$2,069. Similar conclusions can also be reached regarding the ECCU and non-ECCU weekly rental price of mid-size cars (a median of US$330 versus US$302, respectively) and for nightly hotel rates at 100 top Caribbean resorts (a median of US$615 versus US$525, respectively).

19. **Despite the appeal of the ECCU and CARICOM to the high-end of the tourism market, there is some evidence suggesting that tourists responded favorably to lower prices**. Table IV.6 explores the relationship between tourism demand and prices of European vacation packages, hotel taxes, and the cost of a three-minute international call using

---

competitor-based REER is a similar concept, where weights are the shares of tourist arrivals in the competitor Caribbean countries in 2000.

Spearman's rank correlation coefficients.[11] [12] Table IV.7 provides a summary of average ranks of each of the significant paired variables discussed in this section and the subsequent sections discussing supply-side factors and nonprice factors[13]. The fact that the rank correlation coefficient between average stay-over arrivals and average European vacation package prices at 4–5 star resorts was negative and statistically significant means that lower stay-over arrivals tend to be associated with higher vacation package prices (Table IV.6). Moreover, the underlying data, summarized in Table IV.7,[14] confirm that during the period 1995–2001 ECCU countries had higher average European vacation prices and lower average stay-over arrivals, while "other Caribbean destinations" had lower average European vacation package prices and a higher average number of stay-over arrivals.

20. **There was also evidence of demand sensitivity to telecommunication costs (Table IV.6).** The rank correlation between calls to the United States (a proxy for the cost of international calls faced by tourists) and average stay-over arrivals was negative and highly significant (at the 1 percent level). Table IV.7 confirms that the average cost of three-minute telephone calls to the U.S. was higher in ECCU countries and lower in other Caribbean countries, while average stay-over arrivals was higher in other Caribbean countries and lower in ECCU countries.[15] [16]

---

[11] If data are presented in the form of ranks rather than actual values, then the technique of rank correlation can be used. Unlike standard correlation measures (such as Pearson's measure), rank correlations can be used when the underlying distribution of the actual data are unknown or are non-normal.

[12] Spearman's coefficient of rank correlation (r_s) is defined as follows:

$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)}$; where: d = the difference in ranks between two variables; n = the sample size; and $-1 \leq r_s \leq 1$. To test the statistical significance of any relationship, a hypothesis can be performed on ρ_s, the corresponding population parameter: H_0: $\rho_s=0$ and H_1: $\rho_s>0$.

[13] The data were ranked in a descending order, so that the lowest average rank corresponds to the highest average price or value.

[14] Table IV.7 provides a summary of average ranks of each of the significant paired variables discussed in this section. The data were ranked in descending order, so that the lowest average rank corresponds to the highest average price or value.

[15] The relationship between average stay-over arrivals and hotel taxes was examined, but it was not statistically significant, suggesting that relatively affluent tourists may be indifferent to relatively small variations in hotel taxes across the different islands (Table IV.6).

Industry-Specific Price Competitiveness: Supply-Side Factors

21. **In CARICOM, there was a statistically significant negative relationship between hotel accommodations and both electricity and nonresidential telephone subscription costs, indicating a negative association between operating costs and tourist arrivals (Table IV.8).** Table IV.7 confirms that electricity unit costs were higher in the ECCU, which in turn had a lower average number of rooms in tourist accommodation. By contrast, average electricity unit costs were lower in "other Caribbean countries," which in turn had a higher average number of rooms in accommodation. In addition, monthly nonresidential telephone subscription costs were higher in CARICOM as a whole, while average accommodations was lower.[17]

Nonprice Competitiveness

22. **The evidence pointing to a deterioration in the nonprice competitiveness of ECCU and the rest of CARICOM vis-à-vis other Caribbean countries is mostly circumstantial, as these data are harder to obtain.** For instance, after 30 years of operation, significant investment, mainly foreign direct investment (FDI) is most likely needed to refurbish old hotels, build new ones and rejuvenate the industry. In addition, there are concerns that the quality of service in hotels, restaurants and other attractions has not kept pace with market trends.[18] There is also the perception that the ECCU lags behind the rest of the world in technological advances to address the needs of customers, such as access to automated checkouts, internet access, and state-of-the-art websites for information and reservations.[19]

23. **The ECCU and CARICOM have also fallen behind in expenditure on advertising to improve their visibility in the market place.** Moreover, in the immediate aftermath of the events of September 11, worsening fiscal positions have constrained spending on advertising. Traditionally, hotels have spent more on marketing than public

---

[16] A perverse statistically significant relationship was found between cruise passenger taxes and cruise passenger arrivals. This relationship could be spurious (particularly since there were only nine observations comprised mostly of ECCU countries) or could be suggestive of visitor indifference to relatively small fixed travel costs.

[17] Other supply-side factors—such as wage rates and water costs—were not found to have a statistically significant association with tourist arrivals. In the case of the wage bill, the data set was too small to obtain meaningful results.

[18] It was not possible to formalize this analysis however, owing to a dearth of comparative information on FDI across the set of tourism destinations included in this analysis.

[19] The Sandals chain is an exception, as they are reportedly on the cutting edge of the industry when it comes to quality of service.

tourism organizations, but public promotion in the form of "destination advertising" is crucial in maintaining the industry's visibility in the market place.[20] Table IV.7 confirms that CARICOM as a group had a lower average ratio of tourism budgets to GDP. For instance, on average, ECCU countries were reported to have spent around US$14 per stay-over visitor on promotions in 2001, compared with US$36 spent by the Cayman Islands. However, the rank correlation coefficient of average tourist arrivals and the ratio of tourism budgets was positive yet not statistically significant (Table IV.9).

24. **Air access and distance from major customer countries appears to be an important bottleneck in expanding tourism in the region.** Limits on air access are particularly acute during the high season, and have been aggravated by recent route cutting by major airlines. Regarding distance, Table IV.7 shows that on average, ECCU countries are furthest from Miami and also received fewer stay-over visitors, and had fewer flight arrivals from Miami and from the U.S. as a whole in 2003. Table IV.9[21] confirms a highly significant negative rank correlation between distance from the U.S. and average stay-over arrivals, and a highly significant positive rank correlation between average stay-over arrivals and the number of flights from the U.S. and Miami.

25. **The September 11 terrorist attacks on the United States prompted the adoption by Caribbean countries of a host of emergency remedial measures in the short term, designed to mitigate the depressive effect of the shock.** However, the shock also helped to foster a growing awareness of an underlying erosion in ECCU's competitiveness, and of the need to adopt a medium-term response designed to restructure the industry so as to better ensure its long-term survivability The region's medium-term strategic response is summarized in Box IV.1.

[20] This type of advertising is an externality, as it would not be optimally provided by the private sector.

[21] Tourism organizations often guaranteed a percentage of the seats on major airlines and charters so as to ensure the continuity service.

Box IV.1. Caribbean Tourism: Proposed Medium-term Strategic Response

A Regional Tourism Strategic Plan was formulated, through the auspices of the Caribbean Tourism Organization (CTO), in the aftermath of September 11, which seeks to achieve the following objectives by 2012:

- Grow visitor arrivals, increase tourism's economic impact and achieve a more equitable distribution of its benefits.
- Create a product that is sustainable, competitive and profitable.
- Modernize the industry to face a rapidly changing, global environment.
- Fund tourism development on a sustainable basis.
- Achieve synergies and economies of scale through greater cooperation.

In seeking to achieve these objectives the medium-term strategic plan aims to:

- **Promote regional marketing**, funded by the establishment of a *Sustainable Tourism Development Fund* via a mandatory US$5 tax on air and sea visitors.
- **Further develop cruise tourism**, by bringing land-based and cruise entities together to create joint programs and adopting measures to increase the sourcing of supplies for the cruise sector from within the Caribbean.
- **Promote better air access for travellers** by**:** (a) negotiating air services agreements on a regional basis; (b) providing incentives to improve functional cooperation among regional carriers; (c) supporting the development of strategically placed hubs to improve air transportation efficiency; (d) providing marketing support to external and regional carriers; (e) establishing a regional aviation oversight authority; and (f) commercializing the operations of airport authorities.
- **Enhance competitiveness and productivity,** by: (a) researching the impact of taxes on tourism development; (b) adopting strategic measures to accelerate the flow of investment into the sector; (c) investigating the feasibility of a Caribbean Tourism Investment Fund and a Credit Guarantee Scheme; (d) encouraging private sector investment in infrastructural improvements; (e) improving access for small hotels to both equity and loan capital; and (f) providing 100 percent loan guarantees for prestige developments
- **Safeguard the environment, safety, and security,** by: (a) publishing guidelines for the development of sustainable tourism; (b) legislating Environmental Impact Analyses (EIAs) as preconditions to new tourism development; (c) requiring concessions for capital investments that impact on water and energy consumption; (d) providing lines of credit to help small businesses to invest in environmental improvements; (e) creating Tourism Police Task Forces; and (f) outlawing all solicitation on beaches.
- **Promote community tourism,** by: (a) providing concessions and establish a revolving micro-credit line for community based projects; (b) developing a national strategy to strengthen linkages; (c) treating designated suppliers to the tourism sector as exporters; and (d) helping develop and market the region's cultural products as part of economic development.
- **Promote Human Resource Development,** by: (a) developing a quality assurance framework for use within hospitality institutions; (b) introducing tourism education in the formal education system in the schools at all levels; (c) providing tertiary institutions with resources to develop world class tourism education; (d) reviewing the role of regional and national tourism operations, modernize their systems and equip them with the skills needed to manage a modern tourism industry; and (e) legislating to achieve freedom of movement of skills and labour across the region.
- **Develop information and technology,** by: (a) supporting the further development of regional and national internet sites; (b) improving the timeliness and coverage of existing tourism information systems; (c) implementing Tourism Satellite Account (TSA) systems; (d) establishing a Regional Hotel Performance Monitoring System; and (e) developing tourism research capability and programs by the CTO and tertiary institutions.

Source: Caribbean Tourism Organization.

26. **The short-term strategic response to September 11, 2001 encompassed**:

- Subsidies to the tourism industry in the form of tax waivers and tax incentives, subsidized credit to refurbish hotels, and subsidies to regional airlines so as to maintain air access to the region.

- Upgrading security at airports and ports, so as to reassure travelers, with technical assistance from the World Bank and a loan of US$21 million extended to five ECCU countries.

- In the private sector, hotels and airlines responded to the September 11 crisis by offering deep discounts (as much as 30–50 percent) and reducing costs through the streamlining of their operations, including layoffs. Airlines often reduced the number routes, resorted to flying smaller aircraft, and cut back on the quality of in-flight food service.

- The launching of a joint public/private sector US$16 million promotional television campaign, initiated by the CTO, designed to market the region as a whole. However, the program is controversial, and several of the larger tourism destinations—such as Cancun, Cozumel, the Dominican Republic, Puerto Rico and the Cayman Islands—have since withdrawn from the program. The remaining countries are committed to the program, and some have borrowed from the Caribbean Development Bank (CDB) to finance their share of the budget.

- Many of these promotions adversely affected ECCU and CARICOM countries' fiscal situation, either through direct expenditure or through reduced tax revenues from lower hotel receipts. Nevertheless, this was seen as unavoidable under then prevailing conditions. However, in light of the deteriorating fiscal stance of the ECCU region, individual governments may need to re-examine the cost effectiveness of such policies.

D. Policy Implications and Conclusions

27. **Tourism is an important source of income and foreign exchange earnings, employment, and government revenue in the ECCU region.**

28. **The countries of the ECCU have experienced a modest erosion in their price and nonprice competitiveness, in comparison with other Caribbean countries**. The observed loss of tourism shares to other Caribbean markets is partly attributable to the recent appreciation of the competitor-based REER and to tourism-specific price and nonprice factors, including low quality of service. Ensuring the long-term survivability of the industry will require the implementation of measures designed to enhance the industry's price and nonprice competitiveness and reduce U.S. dollar price rigidity in the tourism industry.

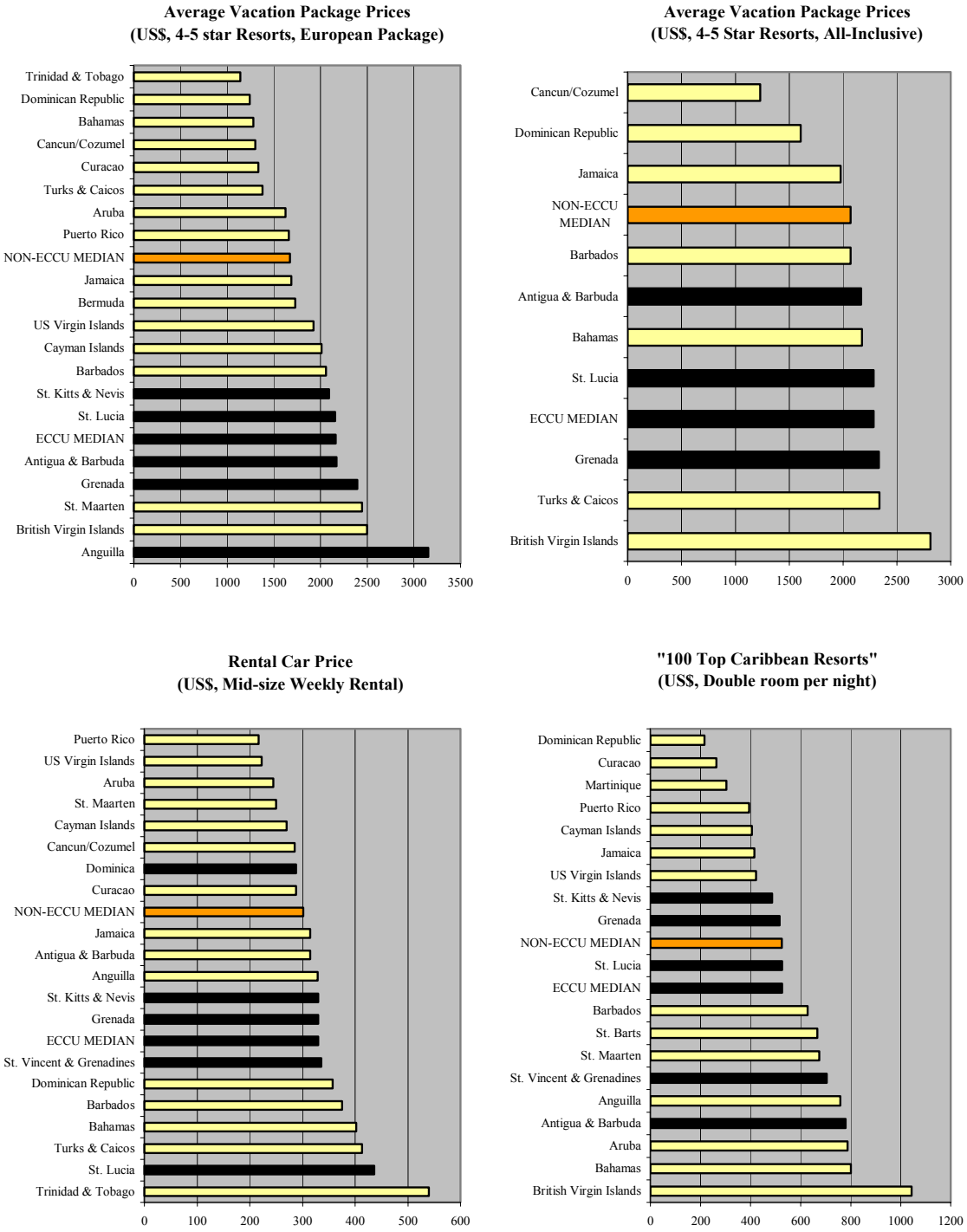
29. **Regarding industry-specific supply-side factors, electricity and telecommunication rates appear to be quite high in CARICOM**. This suggests the need for ECCU and other CARICOM countries to try to pursue common regional arrangements to regulate utilities and reduce market prices. Thus, the establishment of regional regulatory frameworks would help to enhance the productive efficiency and cost competitiveness of tourism enterprises.

30. **There is a continuing need to attract additional FDI to the region, so as to refurbish old hotels and construct new ones**. This calls for an improvement in the cost of doing business within ECCU, as the foregoing analysis showed that high operating costs have served as a deterrent to investment in new facilities. However, in addition to investment in physical capital, there is also a need for investment in human capital development, especially in the hotel and hospitality industries, with a view to enhancing ECCU's nonprice competitiveness.

31. **Further intensification of efforts are needed to stem the decline in air access**. This will necessitate better monitoring of air access to the region. In this regard, a user-friendly database could be developed that provides current, timely information on available flights to different Caribbean destinations.

32. **The potential for expanding tourism in the ECCU region remains vast.** For instance, further development of niches in the yachting market, eco-tourism, the honeymoon market**,** sports tourism, and location filming of TV episodes and movies.

Figure IV.1 Tourism Competitiveness Indicators in the Caribbean, 2003



Sources: Expedia; Showker's "100 Best Resorts of the Caribbean" (2003).

Table IV.1 International and Caribbean Tourism: 1990–2002

Year	World		Caribbean		Caribbean World Share	
	(Stay-over tourist arrivals, in thousands)					
	Tourists	Percent Change	Tourists	Percent Change	Share	Percent Change
Avg. 1990–1999	556.3	4.3	15.9	4.8	2.8	0.5
Avg. 2000–2002	691.4	2.7	19.7	0.0	2.9	-2.7
	(Tourism receipts, in US$ billions)					
	Receipts	Percent Change	Receipts	Percent Change	Share	Percent Change
Avg. 1990–1999	370.8	7.7	13.8	7.8	3.7	0.4
Avg. 2000–2002	467.1	1.5	19.3	1.0	4.1	-0.4

Sources: World Tourism Organization; Caribbean Tourism Organization.

Table IV.2 World Tourism: Tourist Arrivals and Tourism Receipts by Region

(Share of World)

	2000		2001		2002	
	Arrivals	Receipts	Arrivals	Receipts	Arrivals	Receipts
World	100.0	100.0	100.0	100.0	100.0	100.0
Africa	4.0	2.3	4.1	2.6	4.1	2.5
Americas	18.6	28.3	17.6	26.8	16.4	24.1
Caribbean	3.0	4.2	2.9	4.2	2.7	4.0
ECCU	**0.9**	**1.0**	**0.9**	**0.9**	**0.9**	**0.9**
Asia and the Pacific	16.8	17.3	17.7	17.9	18.7	20.0
Europe	57.1	49.6	57.1	50.3	56.9	50.7
Middle East	3.5	2.4	3.5	2.4	3.9	2.7
Memorandum items: 1/						
World	687.4	469.6	684.0	457.4	702.7	474.3
Caribbean	20.4	19.8	19.7	19.3	19.0	18.8

Source: World Tourism Organization and Caribbean Tourism Organization.

1/ Arrivals data in millions and receipts expressed in US$ millions.

Table IV.3. Stayover Tourist Arrivals in the Caribbean by Main Market: 1990–2002

(Arrivals data in millions)

Year	Total Tourists Arrivals	United States Percent Change	United States Percent Share	Canada Percent Change	Canada Percent Share	Europe Percent Change	Europe Percent Share	Other Percent Change	Other Percent Share
Avg. 1990–1999	15.9	2.8	53.7	2.7	5.9	9.8	22.5	4.2	17.9
Avg. 2000–2002	19.7	-0.7	49.6	15.4	7.1	-1.9	25.2	0.0	18.0

Sources: World Tourism Organization; Caribbean Tourism Organization.

Table IV.4 Tourist (Stayover) Arrivals, 1990-2002

	1990	1995	1999	2000	2001	2002
	(In millions)					
World tourist arrivals	457.30	552.30	652.20	687.40	684.00	702.70
Of which						
English-speaking CARICOM	4.00	4.50	4.50	4.56	4.69	4.72
Of which						
ECCU	0.69	0.82	0.82	0.82	0.87	0.88
Other Caribbean countries 1/	3.57	11.69	14.26	15.37	14.85	14.19
	(In millions of U.S. dollars)					
World tourism receipts	267.80	403.00	454.60	469.60	457.40	474.30
Of which						
English-speaking CARICOM	3.45	4.04	4.80	5.09	4.92	4.95
Of which						
ECCU	0.67	0.79	0.95	0.96	0.90	0.90
Other Caribbean countries 1/	6.35	9.93	13.46	14.62	14.44	13.87
	(As a percent of world totals)					
Total Caribbean arrivals	1.66	2.93	2.88	2.90	2.86	2.69
English-speaking CARICOM	0.88	0.81	0.69	0.66	0.69	0.67
ECCU	0.15	0.15	0.13	0.12	0.13	0.13
Other Caribbean countries 1/	0.78	2.12	2.19	2.24	2.17	2.02
Total Caribbean tourism receipts	3.66	3.47	4.02	4.20	4.23	3.97
English-speaking CARICOM	1.29	1.00	1.06	1.08	1.08	1.04
ECCU	0.25	0.20	0.21	0.20	0.20	0.19
Other Caribbean countries 1/	2.37	2.46	2.96	3.11	3.16	2.92

Sources: World Tourism Organization; and Caribbean Tourism Organization.

1/ Reflects the inclusion of the Dominican Republic and Puerto Rico in 1993, and Cancun and Cozumel in 1994.

Table IV.5 Selected Caribbean Market Share Indicators 1/ 2/ 3/

Destination	1990	1995	2000	2001	2002	Average 1995–1999	Average 2000–2002	Change 1995–1999	Change 2000–2002
Stayover tourist arrivals									
CARICOM	31.3	27.8	24.6	24.6	25.5	26.5	24.9	-2.4	0.8
ECCU	5.4	5.0	4.4	4.4	4.6	4.9	4.5	-0.3	0.2
Other	68.7	72.2	75.4	75.4	74.5	73.5	75.1	2.4	-0.8
Cruise passenger arrivals									
CARICOM	50.7	37.3	39.1	38.0	35.9	36.3	37.7	0.4	-3.2
ECCU	9.8	10.1	10.7	10.7	7.5	10.4	9.6	0.7	-3.2
Other	49.3	62.7	60.9	62.0	64.1	63.7	62.3	-0.4	3.2
Estimates of visitor expenditure									
CARICOM	35.2	28.9	26.1	25.3	26.3	27.4	25.9	-2.4	0.2
ECCU	6.8	5.6	4.9	4.7	4.8	5.4	4.8	-0.4	-0.1
Other	64.8	71.1	73.9	74.7	73.7	72.6	74.1	2.4	-0.2
Rooms in tourist accomodation									
CARICOM	58.1	30.6	27.4	27.2	27.1	29.1	27.2	-2.7	-0.3
ECCU	8.7	7.0	6.0	5.8	5.4	6.2	5.7	-1.3	-0.6
Other	41.9	69.4	72.6	72.8	72.9	70.9	72.8	2.7	0.3

Source: Caribbean Tourism Organization.

1/ 'CARICOM' refers to english-speaking, traditional CARICOM members as defined in Appendix Tables IV. 1–8.

2/ The 1990 column is only indicative, since the data for key “Other Caribbean countries” (such as Cancun/Mexico, Cozumel/Mexico, the Dominican Republic, and Puerto Rico) are not available.

3/ The data in this table are expressed as ratios to the respective Caribbean totals.

Table IV.6 Rank Correlation Coefficients Between Tourism Demand and Price Factors 1/

	Vacation Package (European Package)	Telephone Calls (3 mins. to USA)	Cruise Passenger Tax
Demand-side factors:			
Average stayover arrivals, 1995–2001	-0.46 **	-0.82 ***	
No. of observations	19	16	
Average cruise passenger arrivals, 1995–2001			0.83 ***
No. of observations			9

Sources: Caribbean Tourism Organization; Expedia; Showker's "100 Best Resorts of the Caribbean" (2003); World Bank: International Development Indicators and Telecoms and Electricity databases; and National Authorities.

1/ Denotes a significant relationship between bivariate pairs at: "*" the 10 percent level; "**" the 5 percent level; "***" the 1 percent level (Zar, 1972).

Table IV.7 Summary of Average Ranks of Paired Variables for Significant Spearman Rank Correlations 1/ 2/ 3/

	Average Rank		Average Rank
Demand-Side factors: Tourism-Specific Price Factors			
Vacation package (European package)		Average stayover arrivals 1995–2001	
CARICOM	11.2	CARICOM	8.4
ECCU	8.9	ECCU	11.4
Other	12.8	Other	3.3
Telephone calls 3 mins. to USA		Tourist (Stayover) arrivals (thousands)	
CARICOM	6.5	CARICOM	10.4
ECCU	4.0	ECCU	12.7
Other	14.5	Other	2.8
Supply-Side factors: Tourism-Specific Price Factors			
Electricity, (US$/kWh)		Rooms in tourist accommodation	
CARICOM	5.8	CARICOM	8.5
ECCU	4.2	ECCU	9.2
Other	11.0	Other	2.0
Telephone subscription		Rooms in tourist accommodation	
CARICOM	8.3	CARICOM	9.4
ECCU	10.3	ECCU	7.7
Other	10.8	Other	8.0
Nonprice Factors as a Percentage of GDP			
2001 tourism budget 2/		Average stayover arrivals, 1995–01	
CARICOM	9.8	CARICOM	10.9
ECCU	7.9	ECCU	13.9
Other	8.6	Other	4.5
Avg. cruise passenger arrivals (thous.), 1995–01 3/		Average stayover arrivals, 1995–01	
CARICOM	15.0	CARICOM	15.4
ECCU	17.0	ECCU	20.3
Other	11.4	Other	11.1
Distance from Miami (miles)		Average stayover arrivals, 1995–01	
CARICOM	10.8	CARICOM	20.5
ECCU	9.6	ECCU	24.4
Other	18.6	Other	14.2
No. of flights from the U.S. in 2003 1/		Average stayover arrivals, 1995–01	
CARICOM	19.0	CARICOM	20.5
ECCU	22.1	ECCU	24.4
Other	14.6	Other	14.2
No. of flights from Miami in 2003		Average stayover arrivals, 1995–01	
CARICOM	19.3	CARICOM	20.5
ECCU	23.7	ECCU	24.4
Other	14.7	Other	14.2

Sources: As cited in Tables IV.6 and IV.8.

1/ Each row represents a ranked pair. The number of bivariate pairs differ based on data availability. A low rank indicates a higher underlying value since the data are sorted in a descending order.

2/ This rank correlation coefficient was positive as expected, but not statistically significant.

3/ This is a proxy for adequate marketing/advertising.

Table IV.8 Rank Correlation Coefficients Between Supply Conditions and Production Costs 1/

	Electricity Cost	Telephone Subscription
Supply-side factors:		
Rooms in Tourist Accommodation	-0.64 **	-0.86 ***
No. of observations	13	17

Sources: Caribbean Tourism Organization; World Bank Electricity and Telecommunications databases; and national authorities.

1/ Denotes a significant relationship between bivariate pairs at: "*" the 10 percent level; "**" the 5 percent level; "***" the 1 percent level (Zar, 1972).

Table IV.9. Rank Correlation Coefficients Between Nonprice Factors and Tourist Arrivals 1/

	2001 Tourism Budget	Distance from Miami (Miles)	No. of Flights from the U.S. in 2003	No. of Flights from Miami in 2003
Nonprice factors:				
Average stayover arrivals, 1995–2001	0.03	-0.47 ***	0.72 ***	0.62 ***
No. of observations	18	31	31	31

Sources: Caribbean Tourism Organization; http://www.indo.com/distance/index.html.

1/ Denotes a significant relationship between bivariate pairs at: "*" the 10 percent level; "**" the 5 percent level; "***" the 1 percent level (Zar, 1972).

Appendix Table IV.1 Tourist (Stay-Over) Arrivals

(In thousands)

Destination	1990 1/	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average 1998-2002	Percent Change 1995–97 2/	Percent Change 1998–02
Total Caribbean	**12,800.0**	**16,194.2**	**16,756.6**	**17,791.9**	**18,264.4**	**19,119.0**	**20,384.5**	**19,702.4**	**19,040.0**	**16,914.2**	**19,302.1**	**9.9**	**4.2**
Of which:													
English-speaking CARICOM			**4,557.1**	**4,694.6**	**4,721.1**	**4,861.9**	**5,015.9**	**4,856.5**	**4,846.3**	**4,583.7**	**4,860.3**	**1.2**	**0.7**
(Percent of Caribbean Total)	*31.3*	*27.8*	*27.2*	*26.4*	*25.8*	*25.4*	*24.6*	*24.6*	*25.5*	*27.1*	*25.2*	*-11.4*	-1.5
ECCU	**694.4**	**816.1**	**823.7**	**866.6**	**879.8**	**907.9**	**905.2**	**860.9**	**880.8**	**835.5**	**886.9**	**0.3**	**0.0**
(Percent of Caribbean Total)	*5.4*	*5.0*	*4.9*	*4.9*	*4.8*	*4.7*	*4.4*	*4.4*	*4.6*	*4.9*	*4.6*	*-11.9*	-4.0
Anguilla 3/	31.2	38.5	37.5	43.2	43.9	46.8	43.8	48.0	44.0	39.7	45.3	0.0	0.0
Antigua and Barbuda	205.7	220.0	228.2	240.4	234.3	239.6	236.7	222.0	227.0	229.5	231.9	0.1	0.0
Dominica	45.1	60.5	63.3	65.4	65.5	73.5	69.6	66.4	69.2	63.1	68.8	0.0	0.0
Grenada	125.7	108.0	108.2	110.7	115.8	125.3	128.9	123.4	132.4	109.0	125.1	0.0	0.1
Montserrat	18.7	17.7	8.7	5.1	7.7	9.9	10.3	9.8	9.6	10.5	9.5	-0.1	0.0
St. Kitts and Nevis	75.7	78.9	84.2	88.3	93.2	84.0	73.1	70.6	67.5	83.8	77.7	0.1	-0.1
St. Lucia	138.4	232.3	235.7	248.4	252.2	260.6	269.9	250.1	253.5	238.8	257.3	0.1	0.0
St. Vincent and Grenadines	53.9	60.2	57.9	65.1	67.2	68.3	72.9	70.7	77.6	61.1	71.3	0.0	0.1
Non-ECCU	3,309.1	**3,683.3**	**3,733.4**	**3,828.0**	**3,841.3**	**3,954.0**	**4,110.7**	**3,995.6**	**3,965.5**	**3,748.2**	**3,973.4**	**0.9**	**0.7**
(Percent of Caribbean Total)	*25.9*	*22.7*	*22.3*	*21.5*	*21.0*	*20.7*	*20.2*	*20.3*	*20.8*	*22.2*	*20.6*	*-11.3*	-1.0
Bahamas	1,561.60	1,598.1	1,633.1	1,617.6	1,527.7	1,577.1	1,544.0	1,537.8	1,513.1	1,616.3	1,539.9	0.1	-0.1
Barbados	432.1	442.1	447.1	472.3	512.4	514.6	544.7	507.1	497.9	453.8	515.3	0.2	-0.1
Belize	216.4	130.8	132.8	145.9	176.1	180.8	195.8	196.0	199.5	136.5	189.6	0.1	0.1
Guyana	64.2	105.5	92.0	75.7	65.8	74.9	105.0	95.1	104.3	91.1	89.0	-0.2	0.2
Jamaica	840.8	1,147.0	1,162.5	1,192.2	1,225.3	1,248.4	1,322.7	1,276.5	1,266.4	1,167.2	1,267.9	0.3	0.2
Trinidad and Tobago	194	259.8	265.9	324.3	334.0	358.2	398.6	383.1	384.2	283.3	371.6	0.4	0.3
Other Caribbean countries	**8,796.5**	**11,694.7**	**12,199.5**	**13,097.3**	**13,543.4**	**14,257.2**	**15,368.6**	**14,845.9**	**14,193.7**	**12,330.5**	**14,441.7**	**8.7**	**3.6**
(Percent of Caribbean Total)	*68.7*	*72.2*	*72.8*	*73.6*	*74.2*	*74.6*	*75.4*	*75.4*	*74.5*	*72.9*	*74.8*	*4.4*	0.5
Aruba	432.8	618.9	640.8	646.0	647.4	683.3	721.2	691.4	642.6	635.2	677.2	0.2	0.0
Bermuda	432.7	387.5	389.6	379.7	370.0	354.8	332.2	278.1	284.0	385.6	323.8	0.0	-0.5
Bonaire	41.3	59.4	65.1	62.8	61.7	61.5	51.3	50.4	52.1	62.4	55.4	0.0	-0.1
British Virgin Islands 4/	160.1	219.5	243.7	244.3	279.1	285.9	281.1	295.6	284.7	235.8	285.3	0.2	0.0
Cancun (Mexico)	n.a	1,672.0	1,836.0	2,069.3	2,012.3	2,072.2	2,255.3	2,178.7	1,965.4	1,859.1	2,096.8	2.5	-0.3
Cayman Islands 4/	253.2	361.4	373.3	381.2	354.0	345.0	354.1	334.1	302.8	372.0	338.0	0.1	-0.3
Cozumel (Mexico)	n.a	243.5	231.9	159.0	235.2	324.7	230.0	240.5	205.6	211.5	247.2	-0.5	-0.2
Cuba	340.3	762.7	1,004.3	1,170.1	1,415.8	1,602.8	1,774.0	1,774.5	1,686.2	979.0	1,650.7	2.5	1.5
Curacao	207.7	223.8	214.3	205.1	198.6	198.3	191.2	204.6	218.0	214.4	202.1	-0.1	0.1
Dominican Republic	n.a	1,775.9	1,925.6	2,211.4	2,309.1	2,649.4	2,972.6	2,882.0	2,793.6	1,971.0	2,721.3	2.7	2.7
Guadeloupe	288.4	640.0	625.0	660.0	693.0	711.0	807.0	773.4	773.4	641.7	751.6	0.1	0.4
Haiti 5/	120.0	145.4	150.2	148.7	146.8	143.4	140.5	141.6	142.4	148.1	142.9	0.0	0.0
Martinique	281.5	457.2	477.0	513.2	548.8	564.3	526.3	460.4	446.7	482.5	509.3	0.3	-0.6
Puerto Rico	n.a	3,053.9	3,127.7	3,241.8	3,211.0	3,138.7	3,466.1	3,303.8	3,230.5	3,141.1	3,270.0	1.2	0.1
Saba	4.9	10.0	9.8	10.6	10.6	9.3	9.1	9.0	10.8	10.1	9.7	0.0	0.0
St. Eustatius	n.a	8.8	8.2	8.5	8.6	9.2	8.9	9.6	9.8	8.5	9.2	0.0	0.0
St. Maarten	564.7	479.7	364.7	439.2	458.5	444.8	432.3	402.6	380.8	427.9	423.8	-0.3	-0.4
Suriname 5/	28.5	43.4	53.2	61.4	54.6	57.3	56.8	58.4	58.2	52.7	57.1	0.1	0.0
Turks and Caicos Is. 4/	41.9	77.8	86.5	92.1	105.9	117.6	151.4	165.2	153.7	85.5	138.8	0.1	0.3
U.S. Virgin Islands	370	454.0	372.6	392.9	422.3	483.8	607.2	591.9	552.6	406.5	531.6	-0.4	0.7

Source: Caribbean Tourism Organization.

1/ Total Caribbean data for 1990 taken from World Trade Organization statistics due to incomplete country disaggregation.

2/ Change calculated as a percentage of beginning of period "total Caribbean" arrivals.

3/ Anguilla is an associate member of CARICOM.

4/ British Virgin Islands, Cayman Islands, and Turks and Caicos Islands are associate members of CARICOM.

5/ Haiti and Suriname are non-English speaking members of CARICOM.

Appendix Table IV.2 Tourist (Stay-Over) Arrivals

(Percentage shares)

Destination	1990	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average 1998–02	Percent Change 1995–97 1/	Percent Change 1998–02
English-speaking CARICOM	**31.3**	**27.8**	**27.2**	**26.4**	**25.8**	**25.4**	**24.6**	**24.6**	**25.5**	**27.1**	**25.2**	**-1.4**	**-0.4**
ECCU	**5.4**	**5.0**	**4.9**	**4.9**	**4.8**	**4.7**	**4.4**	**4.4**	**4.6**	**4.9**	**4.6**	**-0.2**	**-0.2**
Anguilla 2/	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0
Antigua and Barbuda	1.6	1.4	1.4	1.4	1.3	1.3	1.2	1.1	1.2	1.4	1.2	0.0	-0.1
Dominica	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.0	0.0
Grenada	1.0	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.0	0.1
Montserrat	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	-0.1	0.0
St. Kitts and Nevis	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.0	-0.2
St. Lucia	1.1	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.3	0.0	0.0
St. Vincent and Grenadines	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0
Non-ECCU	**25.9**	**22.7**	**22.3**	**21.5**	**21.0**	**20.7**	**20.2**	**20.3**	**20.8**	**22.2**	**20.6**	**-1.2**	**-0.2**
Bahamas	12.2	9.9	9.7	9.1	8.4	8.2	7.6	7.8	7.9	9.6	8.0	-0.8	-0.4
Barbados	3.4	2.7	2.7	2.7	2.8	2.7	2.7	2.6	2.6	2.7	2.7	-0.1	-0.2
Belize	1.7	0.8	0.8	0.8	1.0	0.9	1.0	1.0	1.0	0.8	1.0	0.0	0.1
Guyana	0.5	0.7	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	-0.2	0.2
Jamaica	6.6	7.1	6.9	6.7	6.7	6.5	6.5	6.5	6.7	6.9	6.6	-0.4	-0.1
Trinidad and Tobago	1.5	1.6	1.6	1.8	1.8	1.9	2.0	1.9	2.0	1.7	1.9	0.2	0.2
Other Caribbean Countries	**68.7**	**72.2**	**72.8**	**73.6**	**74.2**	**74.6**	**75.4**	**75.4**	**74.5**	**72.9**	**74.8**	**1.4**	**0.4**
Aruba	3.4	3.8	3.8	3.6	3.5	3.6	3.5	3.5	3.4	3.8	3.5	-0.2	-0.2
Bermuda	3.4	2.4	2.3	2.1	2.0	1.9	1.6	1.4	1.5	2.3	1.7	-0.3	-0.5
Bonaire	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.0	-0.1
British Virgin Islands 3/	1.3	1.4	1.5	1.4	1.5	1.5	1.4	1.5	1.5	1.4	1.5	0.0	0.0
Cancun (Mexico)	n.a.	10.3	11.0	11.6	11.0	10.8	11.1	11.1	10.3	11.0	10.9	1.3	-0.7
Cayman Islands 3/	2.0	2.2	2.2	2.1	1.9	1.8	1.7	1.7	1.6	2.2	1.8	-0.1	-0.3
Cozumel (Mexico)	n.a.	1.5	1.4	0.9	1.3	1.7	1.1	1.2	1.1	1.3	1.3	-0.6	-0.2
Cuba	2.7	4.7	6.0	6.6	7.8	8.4	8.7	9.0	8.9	5.8	8.6	1.9	1.1
Curacao	1.6	1.4	1.3	1.2	1.1	1.0	0.9	1.0	1.1	1.3	1.0	-0.2	0.1
Dominican Republic	n.a.	11.0	11.5	12.4	12.6	13.9	14.6	14.6	14.7	11.7	14.1	1.5	2.0
Guadeloupe	2.3	4.0	3.7	3.7	3.8	3.7	4.0	3.9	4.1	3.8	3.9	-0.2	0.3
Haiti 4/	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.9	0.7	-0.1	-0.1
Martinique	2.2	2.8	2.8	2.9	3.0	3.0	2.6	2.3	2.3	2.9	2.6	0.1	-0.7
Puerto Rico	n.a.	18.9	18.7	18.2	17.6	16.4	17.0	16.8	17.0	18.6	16.9	-0.6	-0.6
Saba	n.a.	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
St. Eustatius	n.a.	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
St. Maarten	n.a.	3.0	2.2	2.5	2.5	2.3	2.1	2.0	2.0	2.5	2.2	-0.5	-0.5
Suriname 4/	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.0
Turks and Caicos Is. 3/	0.3	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.5	0.7	0.0	0.2
U.S. Virgin Islands	2.9	2.8	2.2	2.2	2.3	2.5	3.0	3.0	2.9	2.4	2.8	-0.6	0.6

Source: Caribbean Tourism Organization.

1/ Change calculated as a percentage of beginning of period "total Caribbean" arrivals.

2/ Anguilla is an associate member of CARICOM.

3/ British Virgin Islands, Cayman Islands, and Turks and Caicos Islands are associate members of CARICOM.

4/ Haiti and Suriname are non-English speaking members of CARICOM.

Appendix Table IV.3 Cruise Passenger Arrivals
(In thousands)

Destination	1990	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average 1998-02	Percent Change 1995-97 1/	Percent Change 1998-02
Total Caribbean 2/	**6,446.0**	**9,884.8**	**10,949.8**	**12,087.6**	**12,422.4**	**12,144.8**	**14,476.3**	**14,791.6**	**16,106.3**	**10,974.1**	**13,988.3**	**22.3**	**29.7**
English-speaking CARICOM	**3,266.5**	**3,685.0**	**3,964.6**	**4,215.0**	**4,371.6**	**4,581.7**	**5,659.1**	**5,626.4**	**5,785.4**	**3,954.9**	**5,204.8**	**5.4**	**11.4**
(Percent of Caribbean Total)	50.7	37.3	36.2	34.9	35.2	37.7	39.1	38.0	35.9	36.0	37.2		
ECCU	**631.8**	**994.3**	**1,061.2**	**1,207.1**	**1,408.1**	**1,311.7**	**1,543.4**	**1,576.6**	**1,208.8**	**1,087.5**	**1,409.7**	**2.2**	**-1.6**
(Percent of Caribbean Total)	9.8	10.1	9.7	10.0	11.3	10.8	10.7	10.7	7.5	9.9	10.1		
Antigua and Barbuda	227.3	227.4	269.6	285.5	336.5	328.0	429.4	408.8	312.2	260.8	363.0	0.6	-0.2
Dominica	6.8	134.9	193.4	230.6	244.6	202.0	239.8	201.5	136.9	186.3	205.0	1.0	-0.9
Grenada	183.2	249.9	267.0	246.6	265.9	245.5	180.3	147.4	135.6	254.5	194.9	0.0	-1.0
St. Kitts and Nevis	33.9	120.9	85.8	102.7	154.1	137.3	164.1	252.2	166.6	103.1	174.9	-0.2	0.1
St. Lucia	102.0	175.9	182.2	310.3	372.1	351.2	443.6	490.2	387.2	222.8	408.9	1.4	0.1
St. Vincent and Grenadines	78.6	85.3	63.2	31.4	34.9	47.7	86.2	76.5	70.3	60.0	63.1	-0.5	0.3
Non-ECCU	**2,634.7**	**2,690.7**	**2,903.4**	**3,007.9**	**2,963.5**	**3,270.0**	**4,115.7**	**4,049.8**	**4,576.6**	**2,867.3**	**2,958.3**	**3.2**	**13.0**
(Percent of Caribbean Total)	40.9	**27.2**	26.5	24.9	23.9	26.9	28.4	27.4	28.4	26.2	27.0		
Bahamas	1,853.9	1,543.5	1,687.1	1,743.7	1,730.0	1,981.5	2,512.6	2,551.7	2,802.1	1,658.1	2,315.6	2.0	8.6
Barbados	362.6	484.7	509.9	517.9	506.6	432.9	533.3	527.6	529.3	504.2	505.9	0.3	0.2
Belize	n.a	7.9	0.1	2.7	14.2	34.1	58.1	48.1	319.7	3.6	94.8	-0.1	2.5
Jamaica	385.8	605.2	658.2	711.7	673.7	764.3	907.6	840.3	865.4	658.4	810.3	1.1	1.5
Trinidad and Tobago	32.4	49.4	48.1	31.9	39.0	57.2	104.1	82.1	60.0	43.1	68.5	-0.2	0.2
Other Caribbean countries	**3,179.5**	**6,199.8**	**6,985.2**	**7,872.6**	**8,050.8**	**7,563.1**	**8,817.2**	**9,165.2**	**10,320.9**	**7,019.2**	**8,783.4**	**16.9**	**18.3**
(Percent of Caribbean Total)	49.3	62.7	63.8	65.1	64.8	62.3	60.9	62.0	64.1	63.9	62.8	3.8	-1.1
Aruba	130.0	294.0	316.9	297.7	257.8	289.0	490.1	487.3	582.2	302.9	421.3	0.0	2.6
Bermuda	112.5	169.7	181.7	181.9	188.3	193.0	209.7	179.5	200.2	177.8	194.1	0.1	0.1
Bonaire	4.5	10.7	14.9	20.4	20.2	14.8	43.5	40.5	42.2	15.3	32.2	0.1	0.2
British Virgin Is. 3/	95.1	122.1	159.6	104.9	105.1	180.7	188.5	202.5	180.8	128.9	171.5	-0.2	0.6
Cayman Is. 3/	361.7	682.9	771.1	866.6	871.4	1,035.5	1,030.9	1,214.8	1,574.8	773.5	1,145.5	1.9	5.7
Cozumel (Mexico)	n.a	908.9	986.7	1,087.9	1,248.9	1,304.0	1,504.6	1,595.4	2,343.1	994.5	1,599.2	1.8	8.8
Curacao	158.6	171.7	173.1	214.7	231.0	220.7	309.4	300.1	318.4	186.5	275.9	0.4	0.7
Dominican Republic	n.a	30.5	110.9	270.8	392.7	283.4	182.4	208.2	247.0	137.4	262.7	2.4	-1.2
Guadeloupe	261.2	419.2	612.6	470.1	334.3	292.7	329.3	361.7	361.7	500.6	335.9	0.5	0.2
Haiti 4/	n.a	225.4	250.4	238.4	246.2	243.3	304.5	263.3	265.6	238.1	264.6	0.1	0.2
Martinique	421.3	428.0	408.4	386.8	414.6	339.1	286.2	202.4	207.4	407.7	289.9	-0.4	-1.7
Puerto Rico	n.a	1,001.1	1,025.1	1,227.4	1,243.4	1,148.6	1,301.4	1,350.3	1,203.9	1,084.5	1,249.5	2.3	-0.3
St. Maarten	515.0	564.3	657.4	886.0	881.4	615.6	868.3	867.8	1,055.0	702.6	857.6	3.3	1.4
U.S. Virgin Islands	1,119.6	1,171.3	1,316.4	1,619.0	1,615.5	1,402.7	1,768.4	1,891.4	1,738.7	1,368.9	1,683.3	4.5	1.0

Source: Caribbean Tourism Organization.

1/ Change calculated as a percentage of beginning of period "total Caribbean" cruise arrivals.
2/ Total excludes Montserrat and Cuba, for which there was insufficient data.
3/ British Virgin Islands and Cayman Islands are associate members of CARICOM.
4/ Haiti is a non-English speaking member of CARICOM.

Appendix Table IV.4 Cruise Passenger Arrivals 1/

(Percentage shares)

Destination	1990	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average 1998–02	Percent Change 1995–97 2/	Percent Change 1998–02
English-speaking CARICOM	**50.7**	**37.3**	**36.2**	**34.9**	**35.2**	**37.7**	**39.1**	**38.0**	**35.9**	**36.1**	**37.2**	**-2.4**	**0.7**
ECCU	**9.8**	**10.1**	**9.7**	**10.0**	**11.3**	**10.8**	**10.7**	**10.7**	**7.5**	**9.9**	**10.2**	-0.1	-3.8
Antigua and Barbuda	3.5	2.3	2.5	2.4	2.7	2.7	3.0	2.8	1.9	2.4	2.6	0.1	-0.8
Dominica	0.1	1.4	1.8	1.9	2.0	1.7	1.7	1.4	0.8	1.7	1.5	0.5	-1.1
Grenada	2.8	2.5	2.4	2.0	2.1	2.0	1.2	1.0	0.8	2.3	1.4	-0.5	-1.3
St. Kitts and Nevis	0.5	1.2	0.8	0.8	1.2	1.1	1.1	1.7	1.0	1.0	1.2	-0.4	-0.2
St. Lucia	1.6	1.8	1.7	2.6	3.0	2.9	3.1	3.3	2.4	2.0	2.9	0.8	-0.6
St. Vincent and Grenadines	1.2	0.9	0.6	0.3	0.3	0.4	0.6	0.5	0.4	0.6	0.4	-0.6	0.2
Non-ECCU	**40.9**	**27.2**	**26.5**	**24.9**	**23.9**	**26.9**	**28.4**	**27.4**	**28.4**	**26.2**	**27.0**	**-2.3**	**4.6**
Bahamas	28.8	15.6	15.4	14.4	13.9	16.3	17.4	17.3	17.4	15.1	14.6	-1.2	3.5
Barbados	5.6	4.9	4.7	4.3	4.1	3.6	3.7	3.6	3.3	4.6	4.3	-0.6	-0.8
Belize	n.a.	0.1	0.0	0.0	0.1	0.3	0.4	0.3	2.0	0.0	0.6	-0.1	1.9
Jamaica	6.0	6.1	6.0	5.9	5.4	6.3	6.3	5.7	5.4	6.0	5.8	-0.2	-0.1
Trinidad and Tobago	0.5	0.5	0.4	0.3	0.3	0.5	0.7	0.6	0.4	0.4	0.5	-0.2	0.1
Other Caribbean Countries	**49.3**	**62.7**	**63.8**	**65.1**	**64.8**	**62.3**	**60.9**	**62.0**	**64.1**	**63.9**	**62.8**	**2.4**	**-0.7**
(Percent of Caribbean Total)	0.8	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.6	0.4	-0.1	-0.1
Aruba	2.0	3.0	2.9	2.5	2.1	2.4	3.4	3.3	3.6	2.8	2.9	-0.5	1.5
Bermuda	1.7	1.7	1.7	1.5	1.5	1.6	1.4	1.2	1.2	1.6	1.4	-0.2	-0.3
Bonaire	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.3	0.1	0.2	0.1	0.1
British Virgin Islands 3/	1.5	1.2	1.5	0.9	0.8	1.5	1.3	1.4	1.1	*1.2*	*1.2*	-0.4	0.3
Cayman Islands 3/	5.6	6.9	7.0	7.2	7.0	8.5	7.1	8.2	9.8	7.0	8.1	0.3	2.8
Cozumel (Mexico)	n.a.	9.2	9.0	9.0	10.1	10.7	10.4	10.8	14.5	9.1	11.3	-0.2	4.5
Curacao	2.5	1.7	1.6	1.8	1.9	1.8	2.1	2.0	2.0	1.7	2.0	0.0	0.1
Dominican Republic	n.a.	0.3	1.0	2.2	3.2	2.3	1.3	1.4	1.5	1.2	1.9	1.9	-1.6
Guadeloupe	4.1	4.2	5.6	3.9	2.7	2.4	2.3	2.4	2.2	4.6	2.4	-0.4	-0.4
Haiti 4/	n.a.	2.3	2.3	2.0	2.0	2.0	2.1	1.8	1.6	2.2	1.9	-0.3	-0.3
Martinique	6.5	4.3	3.7	3.2	3.3	2.8	2.0	1.4	1.3	3.8	2.2	-1.1	-2.0
Puerto Rico	n.a.	10.1	9.4	10.2	10.0	9.5	9.0	9.1	7.5	9.9	9.0	0.0	-2.5
St. Maarten	8.0	5.7	6.0	7.3	7.1	5.1	6.0	5.9	6.6	6.3	6.1	1.6	-0.5
U.S. Virgin Islands	17.4	11.8	12.0	13.4	13.0	11.5	12.2	12.8	10.8	12.4	12.1	1.5	-2.2

Source: Caribbean Tourism Organization.

1/ Total excludes Montserrat and Cuba, for which there was insufficient data.
2/ Change calculated as a percentage of beginning of period "total Caribbean" cruise arrivals.
3/ British Virgin Islands and Cayman Islands are associate members of CARICOM.
4/ Haiti is a non-English speaking member of CARICOM.

Appendix Table IV.5 Estimates of Visitor Expenditure

(In US$ millions)

Destination	1990 1/	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average 1998–02	Percent Change 1995–97	Percent Change 1998–02
Caribbean	**9,800.0**	**13,974.6**	**15,181.1**	**16,247.2**	**17,217.3**	**18,319.2**	**19,779.6**	**19,336.6**	**18,820.2**	**15,134.3**	**18,694.6**	**16.3**	**9.3**
English-speaking CARICOM	**3,449.3**	**4,043.1**	**4,254.4**	**4,419.5**	**4,549.1**	**4,862.8**	**5,162.1**	**4,892.0**	**4,953.2**	**4,239.0**	**4,883.8**	**2.7**	**2.3**
(Percent of Caribbean Total)	*35.2*	28.9	28.0	27.2	26.4	26.5	26.1	25.3	26.3	28.1	26.1		
ECCU	**670.0**	**788.3**	**810.7**	**872.7**	**929.6**	**951.7**	**960.5**	**903.2**	**903.0**	**823.9**	**929.6**	**0.6**	**-0.2**
(Percent of Caribbean Total)			5.3	5.4	5.4	5.2	4.9	4.7	4.8	5.4	5.0		
Anguilla 2/	34.6	48.5	48.0	60.4	61.7	57.7	56.3	62.5	58.0	52.3	59.2	0.1	0.0
Antigua and Barbuda	298.2	246.7	257.9	277.5	281.6	290.0	290.5	272.1	273.8	260.7	281.6	0.2	0.0
Dominica	25.0	34.1	36.6	48.3	46.5	50.7	48.8	46.9	44.7	39.7	47.5	0.1	0.0
Grenada	37.5	65.1	59.5	59.4	112.2	119.0	124.9	112.7	123.5	61.3	118.5	0.0	0.1
Montserrat	7.2	19.9	9.7	5.5	5.6	8.1	9.0	8.5	8.7	11.7	8.0	-0.1	0.0
St. Kitts and Nevis	57.7	65.1	66.8	67.3	76.0	67.7	58.4	61.9	56.1	66.4	64.0	0.0	-0.1
St. Lucia	153.8	267.8	268.5	283.7	272.0	279.6	297.3	258.4	256.2	273.3	272.7	0.1	-0.1
St. Vincent and the Grenadines	56.0	41.1	63.7	70.6	74.0	78.9	75.3	80.2	82.0	70.6	78.1	0.2	0.0
Non-ECCU	2,779.3	**3,254.8**	**3,443.7**	**3,546.8**	**3,619.5**	**3,911.1**	**4,201.6**	**3,988.8**	**4,050.2**	**3,415.1**	**3,954.2**	**2.1**	**2.5**
(Percent of Caribbean Total)	28.4	23.3	22.7	21.8	21.0	21.3	21.2	*20.6*	*21.5*	22.6	21.2		
Bahamas	1,332.9	1,346.2	1,450.0	1,416.2	1,354.1	1,582.9	1,737.9	1,647.6	1,762.1	1,404.1	1,616.9	0.5	2.4
Barbados	493.5	611.8	632.9	657.2	703.0	666.2	711.3	686.8	647.8	634.0	683.0	0.3	-0.3
Belize	91.4	77.6	88.6	88.0	108.3	111.5	120.2	120.5	132.8	84.7	118.7	0.1	0.1
Guyana	26.8	78.2	70.3	61.4	55.8	61.4	86.8	86.6	86.6	70.0	75.4	-0.1	0.2
Jamaica	740.0	1,068.5	1,092.2	1,131.4	1,197.1	1,279.5	1,332.6	1,233.0	1,209.5	1,097.4	1,250.3	0.5	0.1
Trinidad and Tobago	94.7	72.5	109.7	192.6	201.2	209.6	212.8	214.3	211.4	124.9	209.9	0.9	0.1
Other Caribbean Countries	**6,350.7**	**9,931.5**	**10,926.7**	**11,827.7**	**12,668.2**	**13,456.4**	**14,617.5**	**14,444.6**	**13,867.0**	**10,895.3**	**13,810.7**	**13.6**	**7.0**
Of which:								**-1.2**					
(Percent of Caribbean Total)	*64.8*	*71.1*	*72.0*	*72.8*	*73.6*	*73.5*	*73.9*	*74.7*	*73.7*	71.9	73.9	2.4	0.0
Aruba	353.4	521.2	613.5	668.3	621.5	661.6	737.0	739.3	654.1	601.0	682.7	1.1	0.2
Bermuda	490.1	487.9	472.3	477.5	486.8	476.4	431.0	350.5	378.8	479.2	424.7	-0.1	-0.6
Bonaire	132.1	37.0	42.3	44.1	43.4	62.7	62.0	63.7	63.7	41.1	59.1	0.1	0.1
British Virgin Is. 3/	132.1	211.0	227.6	220.4	255.4	299.9	315.1	313.9	353.8	219.7	307.6	0.1	0.6
Cancun (Mexico)	n.a	1,370.6	1,704.6	1,768.1	1,808.7	2,143.7	1,805.2	1,601.9	1,428.8	1,614.4	1,757.7	2.8	-2.2
Cayman Islands 3/	235.7	488.6	456.3	501.2	533.6	524.6	559.2	585.1	585.1	482.0	557.5	0.1	0.3
Cozumel (Mexico)	n.a	146.4	281.2	327.4	398.3	320.0	349.8	371.4	371.4	251.7	362.2	1.3	-0.2
Cuba	243.4	977.0	1,185.0	1,326.0	1,571.0	1,714.0	1,948.2	1,840.4	1,769.1	1,162.7	1,768.5	2.5	1.2
Curacao	238.4	175.4	185.5	200.5	261.1	220.2	226.7	252.7	272.5	187.1	246.6	0.2	0.1
Dominican Republic	n.a.	1,568.4	1,765.5	2,099.4	2,153.1	2,483.2	2,860.2	2,689.8	2,689.8	1,811.1	2,575.2	3.8	3.1
Guadeloupe	197.1	380.4	353.9	371.5	390.1	400.2	454.2	435.3	435.3	368.6	423.0	-0.1	0.3
Haiti 4/	46.0	56.0	58.0	57.0	56.0	55.0	56.0	54.0	54.0	57.0	55.0	0.0	0.0
Puerto Rico	240.0	1,842.1	1,930.2	2,046.3	2,232.9	2,138.5	2,387.9	2,728.1	2,486.4	1,939.5	2,394.8	1.5	1.5
Martinique	n.a.	414.8	410.6	271.3	302.1	262.6	292.2	244.4	232.5	365.6	266.8	-1.0	-0.4
St. Maarten	n.a.	348.8	321.9	378.6	412.9	442.7	482.6	460.6	460.6	349.8	451.9	0.2	0.3
Suriname 4/	10.7	31.0	38.0	63.1	43.7	58.2	44.0	50.0	50.0	44.0	49.2	0.2	0.0
Turks and Caicos Islands 3/	36.5	52.6	99.3	112.9	157.0	238.0	314.0	341.0	341.0	88.3	278.2	0.4	1.1
U.S. Virgin Islands	697	822.3	781.0	894.1	940.6	954.9	1,292.2	1,322.5	1,240.1	832.5	1,150.1	0.5	1.7

Source: Caribbean Tourism Organization.

1/ Total Caribbean data for 1990 taken from World Trade Organization statistics due to incomplete country disaggregation.
2/ Anguilla is an associate member of CARICOM.
3/ British Virgin Islands, Cayman Islands, and Turks and Caicos Islands are associate members of CARICOM.
4/ Haiti and Suriname are non-English speaking members of CARICOM.

Appendix Table IV.6 Estimates of Visitor Expenditure

(Percentage shares)

Destination	1990	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average 1998–02	Change 1995–97	Change 1998–02
English-speaking CARICOM	**35.2**	**28.9**	**28.0**	**27.2**	**26.4**	**26.5**	**26.1**	**25.3**	**26.3**	**28.1**	**26.1**	**-1.7**	**-0.1**
ECCU	**6.8**	**5.6**	**5.3**	**5.4**	**5.4**	**5.2**	**4.9**	**4.7**	**4.8**	**5.5**	**5.0**	**-0.3**	**-0.6**
Anguilla 1/	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.0	-0.1
Antigua and Barbuda	3.0	1.8	1.7	1.7	1.6	1.6	1.5	1.4	1.5	1.7	1.5	-0.1	-0.2
Dominica	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.1	0.0
Grenada	0.4	0.5	0.4	0.4	0.7	0.6	0.6	0.6	0.7	0.4	0.6	-0.1	0.0
Montserrat	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-0.1	0.0
St. Kitts and Nevis	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	-0.1	-0.1
St. Lucia	1.6	1.9	1.8	1.7	1.6	1.5	1.5	1.3	1.4	1.8	1.5	-0.2	-0.2
St. Vincent and the Grenadines	0.6	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.0
Non-ECCU	**28.4**	**23.3**	**22.7**	**21.8**	**21.0**	**21.3**	**21.2**	**20.6**	**21.5**	**22.6**	**21.2**	**-1.5**	**0.5**
Bahamas	13.6	9.6	9.6	8.7	7.9	8.6	8.8	8.5	9.4	9.3	8.6	-0.9	1.5
Barbados	5.0	4.4	4.2	4.0	4.1	3.6	3.6	3.6	3.4	4.2	3.7	-0.3	-0.6
Belize	0.9	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.0	0.1
Guyana	0.3	0.6	0.5	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.4	-0.2	0.1
Jamaica	7.6	7.6	7.2	7.0	7.0	7.0	6.7	6.4	6.4	7.3	6.7	-0.7	-0.5
Trinidad and Tobago	1.0	0.5	0.7	1.2	1.2	1.1	1.1	1.1	1.1	0.8	1.1	0.7	0.0
Other Caribbean Countries	**64.8**	**71.1**	**72.0**	**72.8**	**73.6**	**73.5**	**73.9**	**74.7**	**73.7**	**71.9**	**73.9**	**1.7**	**0.1**
Aruba	3.6	3.7	4.0	4.1	3.6	3.6	3.7	3.8	3.5	4.0	3.6	0.4	-0.1
Bermuda	5.0	3.5	3.1	2.9	2.8	2.6	2.2	1.8	2.0	3.2	2.3	-0.6	-0.8
Bonaire	1.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.1
British Virgin Islands 2/	1.3	1.5	1.5	1.4	1.5	1.6	1.6	1.6	1.9	1.5	1.6	-0.2	0.4
Cancun (Mexico)	n.a.	9.8	11.2	10.9	10.5	11.7	9.1	8.3	7.6	10.6	9.4	1.1	-2.9
Cayman Islands 2/	2.4	3.5	3.0	3.1	3.1	2.9	2.8	3.0	3.1	3.2	3.0	-0.4	0.0
Cozumel (Mexico)	n.a.	1.0	1.9	2.0	2.3	1.7	1.8	1.9	2.0	1.6	1.9	1.0	-0.3
Cuba	2.5	7.0	7.8	8.2	9.1	9.4	9.8	9.5	9.4	7.7	9.4	1.2	0.3
Curacao	2.4	1.3	1.2	1.2	1.5	1.2	1.1	1.3	1.4	1.2	1.3	0.0	-0.1
Dominican Republic	n.a.	11.2	11.6	12.9	12.5	13.6	14.5	13.9	14.3	11.9	13.7	1.7	1.8
Guadeloupe	2.0	2.7	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.3	-0.4	0.0
Guyana	0.3	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.5	0.3	-0.2	0.0
Haiti 3/	0.5	0.4	0.4	0.4	0.3	0.3	12.1	14.1	13.2	0.4	8.0	0.0	12.9
Puerto Rico	2.4	13.2	12.7	12.6	13.0	11.7	1.5	1.3	1.2	12.8	5.7	-0.6	-11.7
Martinique	n.a.	3.0	2.7	1.7	1.8	1.4	2.4	2.4	2.4	2.4	2.1	-1.3	0.7
St. Maarten	n.a.	2.5	2.1	2.3	2.4	2.4	0.2	0.3	0.3	2.3	1.1	-0.2	-2.1
Suriname 3/	0.1	0.2	0.3	0.4	0.3	0.3	1.6	1.8	1.8	0.3	1.1	0.2	1.6
Turks and Caicos Islands 2/	0.4	0.4	0.7	0.7	0.9	1.3	1.6	1.8	1.8	0.6	1.5	0.3	0.9
U.S. Virgin Islands	7.1	5.9	5.1	5.5	5.5	5.2	6.5	6.8	6.6	5.5	6.1	-0.4	1.1

Source: Caribbean Tourism Organization.

1/ Anguilla is an associate member of CARICOM.

2/ British Virgin Islands, Cayman Islands, and Turks and Caicos Islands are associate members of CARICOM.

3/ Haiti and Suriname are non-English speaking members of CARICOM.

Appendix Table IV.7 Rooms in Tourist Accommodation

Destination	1990	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average 1998–02	Percent Change 1995–97	Percent Change 1998–02
Total Caribbean	**121,986**	**198,614**	**209,633**	**219,382**	**232,631**	**237,706**	**253,325**	**261,866**	**261,806**	**209,210**	**249,467**	**10.5**	**12.5**
English-speaking CARICOM	**70,824**	**60,786**	**62,783**	**63,261**	**65,267**	**66,426**	**69,409**	**71,196**	**70,865**	**62,277**	**68,633**	**1.2**	**2.4**
(Percent of Caribbean Total)	*58.1*	*30.6*	*29.9*	*28.8*	*28.1*	*27.9*	*27.4*	*27.2*	*27.1*	*29.8*	*27.5*		
ECCU	**10,669**	**13,931**	**13,331**	**13,383**	**13,937**	**13,692**	**15,254**	**15,170**	**14,114**	**13,548**	**14,433**	**-0.3**	**0.1**
(Percent of Caribbean Total)	*8.7*	*7.0*	*6.4*	*6.1*	*6.0*	*5.8*	*6.0*	*5.8*	*5.4*	*6.5*	*5.8*		
Anguilla 1/	741	951	866	915	1,045	1,120	1,067	1,069	1,037	911	1,068	0.0	0.0
Antigua and Barbuda	2,752	3,317	3,185	3,185	3,185	3,185	3,185	3,185	3,185	3,229	3,185	-0.1	0.0
Dominica	531	588	764	824	824	857	890	899	889	725	872	0.1	0.0
Grenada	1,105	1,652	1,669	1,775	1,802	1,928	1,822	1,734	1,777	1,699	1,813	0.1	0.0
Montserrat	710	710	n.a	n.a	n.a	243	264	242	257	710	252	n.a	n.a
St. Kitts and Nevis	1,402	1,563	1,610	1,729	1,762	1,754	1,754	1,754	1,754	1,634	1,756	0.1	0.0
St. Lucia	2,370	3,974	3,986	3,701	3,769	3,065	4,525	4,525	3,711	3,887	3,919	-0.1	0.0
St. Vincent and Grenadines	1,058	1,176	1,251	1,254	1,550	1,540	1,747	1,762	1,504	1,227	1,621	0.0	0.0
Non-ECCU	**60,155**	**46,855**	**49,452**	**49,878**	**51,330**	**52,734**	**54,155**	**56,026**	**56,751**	**48,728**	**54,199**	**1.5**	**2.3**
(Percent of Caribbean Total)		*23.6*	*23.6*	*22.7*	*22.1*	*22.2*	*21.4*	*21.4*	*21.7*	*23.3*	*21.7*		
Bahamas	13,475	13,421	13,288	13,288	14,243	14,153	14701	15195	15145	13,332	14,687	-0.1	0.4
Barbados	6,709	5,084	6,315	5,349	5,752	6,585	6456	6781	6742	5,583	6,463	0.1	0.4
Belize	2,115	3,708	3,690	3,905	3,921	3,963	4106	4463	4705	3,768	4,232	0.1	0.3
Guyana	538	639	639	730	730	730	730	730	730	669	730	0.0	0.0
Jamaica	16,103	20,896	21,984	22,954	22,713	23,067	23630	24007	24239	21,945	23,531	1.0	0.7
Trinidad and Tobago	21,215	3,107	3,536	3,652	3,971	4,236	4532	4850	5190	3,432	4,556	0.3	0.5
Other Caribbean Countries	**51,162**	**137,828**	**146,850**	**156,121**	**167,364**	**171,280**	**183,916**	**190,670**	**190,941**	**146,933**	**180,834**	**9.2**	**10.1**
(Percent of Caribbean Total)		*69.4*	*70.1*	*71.2*	*71.9*	*72.1*	*72.6*	*72.8*	*72.9*	*70.2*	*72.5*		
Aruba	5,736	6,881	6,822	6,962	7,212	7,320	7500	7500	7500	6,888	7,406	0.0	0.1
Bermuda	4,265	4,141	4,152	4,135	3,857	3,276	3339	3337	3251	4,143	3,412	0.0	-0.3
Bonaire	1,038	1,052	1,128	1,069	1,086	989	1050	1001	1070	1,083	1,039	0.0	0.0
British Virgin Islands 2/	1,138	1,452	1,558	1,587	1,594	1,626	1661	1688	1765	1,532	1,667	0.1	0.1
Cancun (Mexico)	n.a	20,278	21,850	21,683	23,581	24,610	25,434	26194	25829	21,270	25,130	0.7	1.0
Cayman Islands 2/	3,064	3,585	4,477	4,501	4,216	4,318	5,364	5494	5238	4,188	4,926	0.5	0.4
Cozumel (Mexico)	n.a	3,367	3,468	3,562	3,704	3,956	4,101	4826	4007	3,466	4,119	0.1	0.1
Cuba	12,868	24,233	26,878	31,837	35,708	33,000	38,072	40158	41323	27,649	37,652	3.8	2.4
Curacao	1,631	1,950	2,343	2,696	2,528	2,768	2941	3203	3238	2,330	2,936	0.4	0.3
Dominican Republic	n.a	32,475	35,729	38,250	42,412	49,410	51,916	53964	54730	35,485	50,486	2.9	5.3
Guadeloupe	6,064	7,917	8,294	8,350	8,371	8,260	8,136	8019	8019	8,187	8,161	0.2	-0.2
Haiti 3/	n.a	1,758	1,758	1,758	1,758	1,758	1,758	1758	1758	1,758	1,758	0.0	0.0
Martinique	5,802	7,210	7,300	7,400	7,400	7,341	8,733	8733	8733	7,303	8,188	0.1	0.6
Puerto Rico	n.a	10,251	10,245	10,849	11,828	11,635	11,928	12753	12788	10,448	12,186	0.3	0.4
Saba	90	186	186	186	91	87	80	85	85	186	86	0.0	0.0
St. Eustatius	n.a	139	77	77	77	62	62	62	62	98	65	0.0	0.0
St. Maarten	3,400	3,707	3,910	4,049	4,174	3,065	3,545	3548	3548	3,889	3,576	0.2	-0.3
Suriname 3/	532	1,024	1,088	1,276	1,276	1,276	1,276	1276	1276	1,129	1,276	0.1	0.0
Turks and Caicos Islands 2/	1,014	1,068	1,500	1,493	1,562	1,674	2,023	2023	1629	1,354	1,782	0.2	0.0
U.S. Virgin Islands	4,520	5,154	4,087	4,401	4,929	4,849	4,997	5,048	5,092	4,547	4,983	-0.4	0.1

Source: Caribbean Tourism Organization.

1/ Anguilla is an associate member of CARICOM.

2/ British Virgin Islands, Cayman Islands, and Turks and Caicos Islands are associate members of CARICOM.

3/ Haiti and Suriname are non-English speaking members of CARICOM.

Appendix Table IV.8 Rooms in Tourist Accommodation

(Percentage shares)

Destination	1990	1995	1996	1997	1998	1999	2000	2001	2002	Average 1995–97	Average 1998–02
English-speaking CARICOM	**58.1**	**30.6**	**29.9**	**28.8**	**28.1**	**27.9**	**27.4**	**27.2**	**27.1**	**28.8**	**28.2**
ECCU	**8.7**	**7.0**	**6.4**	**6.1**	**6.0**	**5.8**	**6.0**	**5.8**	**5.4**	**6.2**	**6.0**
Anguilla 1/	0.6	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4
Antigua and Barbuda	2.3	1.7	1.5	1.5	1.4	1.3	1.3	1.2	1.2	1.4	1.4
Dominica	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
Grenada	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.8	0.8
Montserrat	0.6	0.4	n.a.	n.a.	n.a.	0.1	0.1	0.1	0.1	0.2	0.1
St. Kitts and Nevis	1.1	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.7
St. Lucia	1.9	2.0	1.9	1.7	1.6	1.3	1.8	1.7	1.4	1.7	1.7
St. Vincent and Grenadines	0.9	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.6
Non-ECCU	**49.3**	**23.6**	**23.6**	**22.7**	**22.1**	**22.2**	**21.4**	**21.4**	**21.7**	**22.6**	**22.2**
Bahamas	11.0	6.8	6.3	6.1	6.1	6.0	5.8	5.8	5.8	6.2	6.0
Barbados	5.5	2.6	3.0	2.4	2.5	2.8	2.5	2.6	2.6	2.6	2.6
Belize	1.7	1.9	1.8	1.8	1.7	1.7	1.6	1.7	1.8	1.7	1.7
Guyana	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Jamaica	13.2	10.5	10.5	10.5	9.8	9.7	9.3	9.2	9.3	10.0	9.8
Trinidad and Tobago	17.4	1.6	1.7	1.7	1.7	1.8	1.8	1.9	2.0	1.7	1.7
Other Caribbean Countries	**41.9**	**69.4**	**70.1**	**71.2**	**71.9**	**72.1**	**72.6**	**72.8**	**72.9**	**71.2**	**71.8**
Aruba	4.7	3.5	3.3	3.2	3.1	3.1	3.0	2.9	2.9	3.2	3.1
Bermuda	3.5	2.1	2.0	1.9	1.7	1.4	1.3	1.3	1.2	1.7	1.6
Bonaire	0.9	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5
British Virgin Islands 2/	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7
Cancun (Mexico)	n.a.	10.2	10.4	9.9	10.1	10.4	10.0	10.0	9.9	10.2	10.1
Cayman Islands 2/	2.5	1.8	2.1	2.1	1.8	1.8	2.1	2.1	2.0	2.0	2.0
Cozumel (Mexico)	n.a.	1.7	1.7	1.6	1.6	1.7	1.6	1.8	1.5	1.6	1.7
Cuba	10.5	12.2	12.8	14.5	15.3	13.9	15.0	15.3	15.8	14.0	14.5
Curacao	1.3	1.0	1.1	1.2	1.1	1.2	1.2	1.2	1.2	1.1	1.2
Dominican Republic	n.a.	16.4	17.0	17.4	18.2	20.8	20.5	20.6	20.9	18.4	19.1
Guadeloupe	5.0	4.0	4.0	3.8	3.6	3.5	3.2	3.1	3.1	3.7	3.5
Haiti 3/	n.a.	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.8
Martinique	4.8	3.6	3.5	3.4	3.2	3.1	3.4	3.3	3.3	3.4	3.3
Puerto Rico	n.a.	5.2	4.9	4.9	5.1	4.9	4.7	4.9	4.9	4.9	4.9
Saba	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
St. Eustatius	n.a.	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
St. Maarten	2.8	1.9	1.9	1.8	1.8	1.3	1.4	1.4	1.4	1.7	1.6
Suriname 3/	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Turks and Caicos Islands 2/	0.8	0.5	0.7	0.7	0.7	0.7	0.8	0.8	0.6	0.7	0.7
U.S. Virgin Islands	3.7	2.6	1.9	2.0	2.1	2.0	2.0	1.9	1.9	2.1	2.0

Source: Caribbean Tourism Organization.

1/ Anguilla is an associate member of CARICOM.
2/ British Virgin Islands, Cayman Islands, and Turks and Caicos Islands are associate members of CARICOM.
3/ Haiti and Suriname are non-English speaking members of CARICOM.

References

Blanchard, M., 2002, "An assessment of competitiveness of the ECCU's tourism Industry", Mimeo.

Caribbean Tourism Organization, 2000, *St. Lucia: Economic Impact of Visitor Expenditure—1998*, Draft Report, Tourism Impact Project.

Caribbean Tourism Organization, 2002a, *Caribbean Tourism Statistical Report, 2001-02 and Caribbean Tourism Statistical Report*, 2002–03.

Caribbean Tourism Organization, 2002b, *Caribbean Tourism Overview*; Arley Sobers.

Caribbean Tourism Organization, 2002c, *Caribbean Tourism Strategic Plan*, Presentation to CTO Council of Ministers, October, 2002.

Caribbean Tourism Organization, 2003, *Key Tourism Statistics*, January–March 2003 Volume 1, Number 1.

Hassan, S. S., 2000, Determinants of Market Competitiveness in an Environmentally Sustainable Tourism Industry, *Journal of Travel Research*. Vol. 38, pp. 239-245.

Helleiner, G.K., 1991, Increasing International Competitiveness: A conceptual Framework. In Y. Wen and J. Sengupta (eds.) *Increasing the International Competitiveness of Exports from Caribbean Countries*. Washington, D.C.: Economic Institute of the World Bank. pp 17–26.

Lancaster, K., 1971, *Consumer Demand: A New Approach*, Columbia University Press, New York.

Porter, M.E., 1985, *Competitive Advantage: Creating and Sustaining Superior Performance*. New York, The Free Press

Samuel, W., and R. Randall, 2003, "Tourism in the Eastern Caribbean: Meeting the Competitive Threat"; *IMF Country Report No.03/88, ECCU Selected Issues,* International Monetary Fund.

Vernon, R., 1966, "International Investment and International Trade in the Product Cycle", *Quarterly Journal of Economics*, Vol. 80, pp. 190–207.

World Development Indicators, 2003, World Bank.

World Telecommunications Indicators Database, 2003, ITU, World Bank.

Zar, J.H., 1972, "Significance Testing of the Spearman Rank Correlation Coefficient", *Journal of the American Statistical Association*, Vol. 67, pp. 578–80.

V. PUBLIC DEBT ACCUMULATION IN THE ECCU[1]

A. Introduction

1. **Public debt has increased substantially in the Eastern Caribbean Currency Union (ECCU) since 1998**. The average public debt to GDP ratio of the six Fund member countries of the ECCU has increased from about 60 percent in 1997 to over 100 percent in 2003. Some countries are already facing difficulties in servicing their debt—Antigua and Barbuda is running arrears, while Dominica is undertaking major tax reforms and attempting to restructure its public debt.[2] For about a decade prior to 1998, public debt was high but stable at around 60 percent of GDP (Figures V.1 and V.2). A natural question suggested by these figures is to ask: What caused the sharp increase in the public debt to GDP ratio after 1998?

2. **A debt accounting exercise is used in this chapter to analyze the sources of the public debt build up in the ECCU.** The chapter follows the methodology of Helbling, Mody, and Sahay (2003), HMS henceforth. In essence, the exercise decomposes the sources that contributed to the rise in the public debt to GDP ratio, and quantifies their contributions over time.

3. **This chapter does not analyze whether the accumulation of public debt was an optimal response to policies and exogenous shocks.** The issue of optimality is a very important and complex one and is beyond the scope of this chapter (see for instance, International Monetary Fund, 2003). However, the information provided in this chapter could be used to compare the implications of optimal debt models.

4. **The rest of the chapter is organized as follows.** Section B presents a formal description of the methodology used to decompose the rise of the public debt-to-GDP ratio. Section C presents the results of the debt decomposition. Section D focuses on developments in primary fiscal balances, a key contributor to the debt build-up. Section E concludes.

B. Decomposing Public Sector Debt Dynamics

5. **Equation (1) describes the accumulation of public sector debt.** For simplicity, and given that the nominal exchange rate in the ECCU has been fixed during the period under study, the equation measures all variables in U.S. dollars. F_t and D_t are, respectively, foreign and domestic public debt at the beginning of period t, while $GBAL_t$ is the government's primary fiscal balance during period t. $GRANTS_t$ represents the grant

[1] Prepared by Pedro Rodriguez and Paul Cashin.

[2] The accumulation of public debt during the second half of the 1990s has also affected the probability of an external crisis in ECCU countries. See the Appendix for an assessment of the vulnerability of the ECCU.

component of government revenue, which can be used to finance deficits without creating new debt. Since the EC dollar has had a hard peg (to the U.S. dollar) for nearly 30 years, it is assumed that the interest rate, i_t, is independent of the currency denomination of the debt. Additionally, since no distinction is being made between foreign and domestic debt, B_t will be used to denote the country's total public debt. EVT_t (event) denotes any event that does not appear in the fiscal accounts, but modifies the public debt at time t:[3]

$$\left(F_{t+1} - F_t\right) + \left(D_{t+1} - D_t\right) = -GBAL_t - GRANTS_t + i_t\left(F_t + D_t\right) + EVT_t . \qquad (1)$$

6. **Equation (2) below is obtained from equation (1), where the variables are expressed as shares of GDP.** Let Z_t denote the U.S. dollar denominated value of a country's GDP. Thus, $Z_t = Y_t{*}P_t$, where Y_t is the real GDP (measured in units of goods) and P_t is the U.S. dollar price index. Dividing both sides of equation (1) by Z_t and rearranging terms, we obtain equation (2), where: $b_{t+1} \equiv \frac{B_{t+1}}{Z_t}$ is the public debt to GDP ratio at the beginning of period t+1; $gbal_t$ is the primary balance (excluding grants) as a proportion of GDP; $grants_t$ is expressed as a proportion of GDP; and i_t is the interest rate. Real output growth and the growth of dollar denominated prices are denoted by $\hat{Y}_t$ and $\hat{P}_t$, respectively, while evt_t denotes the value of events as a proportion of GDP:

$$b_{t+1} - b_t = -gbal_t - grants_t + \frac{i_t - \hat{Y}_t}{\left(1+\hat{Y}_t\right)\left(1+\hat{P}_t\right)} b_t - \frac{\hat{P}_t}{\left(1+\hat{P}_t\right)} b_t + evt_t . \qquad (2)$$

7. **Note that the grants component of the primary balance (which is not a policy variable) differs from the nongrants component (which is a policy variable).** Hence, in the remaining sections of this chapter the term "primary balance (excluding grants)" is used to refer to the nongrants component of the primary balance, while "primary balance (including grants)" is used to refer to the traditional primary balance concept.

[3] Four events have been identified: Antigua and Barbuda had a reduction in the value of its arrears in 1997 equivalent to 13.1 percent of GDP; the government of Grenada borrowed an amount equivalent to 11.4 percent of GDP to extinguish lease arrangements that had not been previously included as debt; public enterprises in St. Kitts and Nevis increased their debt by 8.8 percent of GDP in 1997 (not included in our fiscal accounts since only central government data is available for this country); and the government in St. Vincent and the Grenadines took over private debt in 1999 (for an amount equivalent to 17.5 percent of GDP).

C. Results of Debt Decomposition

8. **The analysis is divided into two sub-periods, 1991–97 (when debt was stable) and 1998–2003 (when debt rose sharply).**[4] Figure V.3 illustrates that during the second sub-period, economic growth was slower and the fiscal accounts deteriorated sharply. The rise in fiscal deficits resulted from an increase in primary deficits (including grants) and higher interest payments (resulting from the larger stock of debt). While exports of goods and services do not directly affect equation (2), they are of critical importance for GDP and, as a consequence, are presented in Table V.1. Exports of goods and services declined substantially in all ECCU countries (with the exception of St. Kitts and Nevis), especially during 2001–02, when tourism-related activities contracted sharply following the terrorist attacks of September 11, 2001.

9. **Table V.2 presents the results obtained from estimating equation (2) for the ECCU.** Public debt to GDP in the ECCU increased, on average, by 7.6 percent of GDP per year during the period 1998–2003, of which 2.7 percent of GDP is accounted for by the deterioration of fiscal primary balances (including grants) and 2.5 percent of GDP by the net effect of interest payments and output growth. Around 3.0 percent of GDP cannot be explained using the sources presented in equation (2).

10. **When comparing across the two sub-periods, the negative effect of the primary fiscal balance (including grants) is much larger than those originating from lower growth and higher interest payments** (Table V.2). Of the 8.1 percent of GDP increase in the average public debt to GDP ratio across the two sub-periods, about 3.2 percent of GDP can be explained by the worsening of the primary fiscal balance (including grants), while the net effect of interest payments and output growth accounts for 1.2 percent of GDP, and the unexplained component accounts for about 2.2 percent of GDP. The price effect and the "events" category account for about 1.4 percent of GDP.

11. **The unexplained component of the debt accumulation can be attributed to measurement errors in the fiscal accounts and the stock of public debt.** To determine whether the unexplained component of the debt accumulation is driven by a particular country, Table V.3 presents the results of equation (2) for each country. The "unexplained" component is more important for Grenada, St. Kitts and Nevis, and St. Lucia. The positive sign of the "unexplained" component suggests that the actual increase in public debt is most

[4] Data on public sector debt, government fiscal balance, interest payments, public debt, and real GDP growth were obtained from ECCU country authorities, while those on natural disasters are from the EM-DAT database compiled by the Centre for Research on the Epidemiology of Disasters (see also IMF, 2004). Data on public debt corresponds to the public sector for all countries, but the coverage of the fiscal data varies across countries, since consolidated public sector data was only available for Antigua and Barbuda, St. Lucia, and St. Vincent and the Grenadines.

likely underestimated—this result is consistent with the hypothesis of imperfect coverage in the fiscal accounts.

D. Worsening of the Fiscal Accounts: Why?

12. **In this section, an examination is made of the changes in government revenues and expenditures and of the incidence of natural disasters in the region, in order to shed some light on the question—why did the ECCU's fiscal accounts worsen in recent years?** This question is motivated by the importance that fiscal primary deficits have in explaining the public debt build-up in ECCU countries. As is demonstrated below, the worsening of the fiscal accounts is driven by changes in government expenditures, which, in most cases, are driven by government current expenditures. Additionally, with the exception of St. Kitts and Nevis, the incidence of natural disasters does not look very different in the sub-period of public debt accumulation (1998–2003) vis-à-vis the sub-period of public debt stability (1991–97). As a consequence, the picture that emerges in this section is that the increase in government deficits in the region was to a large extent a decision made by the governments themselves, and not one that emanated from exogenously-caused natural disasters.

13. **The results indicate that as GDP growth decelerated in 1998–2003, countercyclical policies were pursued with vigor.** When shocks are permanent, as some have been, pursuing countercyclical policies is not optimal. Regarding the transitory shocks that ECCU economies faced, an argument can be made to smooth the path of national consumption. However, such a policy needs to be balanced by higher public savings in good times, otherwise rising public debt in the medium term will become unavoidable.

Central Government—Revenues and Expenditures

14. **This section focuses on the behavior of the central government, given that, as mentioned above, there is lack of data on the consolidated public sector for three of the six countries.** Despite the reduced coverage that use of this narrow definition of government produces, the use of a homogeneous definition of government does have the advantage of enabling a more accurate comparison of fiscal issues across countries.

15. **Government expenditures as a share of GDP increased substantially during the period of public debt accumulation, while government revenues were stable (Figure V.4).** Only in the case of St. Lucia is there observed an important decline in government revenues.

16. **Increases in current expenditures were a factor behind the increase in central government spending in five of the six ECCU countries (Figure V.5).** The exception is Grenada, where the increase in government expenditure seems to be associated with higher capital expenditures. Two countries, Dominica and St. Kitts and Nevis, witnessed an increase in both current and capital expenditures. In the case of St. Kitts and Nevis, the higher capital expenditure was likely associated with public reconstruction projects caused by the impact of natural disasters (see below). Importantly, noninterest expenditures is the most dynamic

component, and main driving force, underpinning the behavior of current expenditures (Figure V.6). In addition, and consistent with the sharp increase in public debt, interest expenditures have been rising steadily for most countries.

Did Natural Disasters Play a Role?

17. **Given that ECCU countries rank among the most prone to natural disasters in the world (see Chapter II of this paper), it is reasonable to examine whether the large increase in public debt may be associated with a jump in the incidence of natural disasters.** Natural disasters affecting ECCU countries during the period 1990–2002 are chronicled in Table V.4.[5] [6]

18. **Based on the number of people affected, only St. Kitts and Nevis seems to have had a higher incidence of natural disasters in the sub-period 1998–2003.** In addition, this country has been affected by three large natural disasters since 1995. Therefore, it is not surprising that the public debt increase in this country started earlier than in the other countries (see Figure V.2), and that both current and capital government expenditures have increased steadily since 1995 (see Figure V.5).

19. **Clearly, natural disasters have an impact on both fiscal revenues and expenditure, and ultimately on the path of public debt accumulation.** However, with the exception of St. Kitts and Nevis, for most ECCU countries the incidence of natural disasters during 1998–2003 (the period of debt accumulation) does not seem to be greatly different from the incidence observed during the period 1991–97 (the period of stable debt stocks). Accordingly, there is little evidence to support the thesis that the sharp increase in the public debt to GDP ratio in the latter sub-period is associated with an increased incidence of natural disasters.

E. Conclusions

20. **This chapter contained an analysis of the dominant sources of the accumulation of public debt in ECCU countries since 1998.** The analysis concentrated on determining what underpinned the rise in the public debt to GDP ratio during 1998–2003 vis-à-vis 1991–97 (a period of stability in the public debt to GDP ratio).

---

[5] We include 1990 because natural disasters in the region usually occur in the second part of the year, and, as a result, they may have affected the public debt accumulation process of 1991.

[6] Natural disasters are defined here as events due to natural causes that caused 10 or more fatalities, affected 100 or more people, or resulted in a call for international assistance or the declaration of a state of emergency.

21. **The main conclusions are:**

- **The worsening of fiscal primary balances (both including and excluding grants) is the major source of accumulation of public debt.** Of an increase in the public debt to GDP ratio of 8.1 percent of GDP per year during the period 1998–2003 with respect to the period 1991–97, the fiscal primary balance (including grants) explains 3.2 percent of GDP. The effect that accounts for the impact of higher interest expenses and lower growth accounts for 1.2 percent of GDP; about 2.2 percent of GDP remains unexplained.

- **For some countries there is a large unexplained component that in general indicates that the sources of accumulation underestimate the actual increase in public debt.** Measurement error may be behind this problem, especially those countries for which fiscal accounts do not consider public enterprises.

- **In most countries, the worsening of the fiscal accounts was driven by an increase in current expenditures**. Higher capital expenditures were a factor behind the worsening of the fiscal accounts only in Grenada and St. Kitts and Nevis. The share of fiscal revenues to GDP did not display significant change in any of the countries during the period of debt accumulation (1998-2003). Only in St. Lucia has there been a decline in the share of central government revenues to GDP.

- **The more frequent incidence of natural disasters does not seem to be the reason behind the deterioration of most countries' fiscal accounts.** More specifically, only St. Kitts and Nevis has been significantly more affected by natural disasters during the period of public debt accumulation vis-à-vis the period of public debt stability.

- **The analysis also identified that at the same time public debt was accumulating, there was a decline in economic growth in the region.** This suggests that the larger primary fiscal deficits may have been a policy response to the region's adverse economic conditions (among them, the decline of the banana and sugar industries, high levels of unemployment, and the impact on tourism of the terrorist attacks of September 11, 2001).

External Crisis: Early Warning System Analysis for the ECCU

A recent approach to assessing external sustainability is to develop a systematic empirical framework for predicting currency and balance of payments crises (a so-called "early warning system") using economic and financial indicators that provide a timely indication of the potential vulnerability of a country's balance of payments position. Early warning system models can be a useful adjunct to the IMF's traditional surveillance process, as such an objective approach avoids country-specific biases in the evaluation of the potential for crises. The predictability of currency and balance of payments crises has been examined in a number of recent papers (see Berg and Pattillo, 1999), and in this appendix an extension of the IMF's Developing Country Studies (DCSD) model is applied to the ECCU.

The modeling approach used is as follows. A multivariate probit model is estimated on monthly data for a panel of 35 developing economies over the period 1970:1–2000:7.[1] The dependent variable in the model takes a value of one if there is a balance of payments crisis within the next 24 months, and zero otherwise. A crisis is defined to have occurred when an "exchange market pressure" index (calculated as a weighted average of monthly real exchange rate depreciations and monthly percentage declines in reserves) exceeds its country-specific mean by more than three standard deviations. The independent variables in the early warning system model include: real exchange rate overvaluation relative to trend; current account deficit as a percentage of GDP; foreign exchange reserve losses; export growth; and the ratio of external debt to foreign exchange reserves.[2] The probability of a crisis is found to increase when the real exchange rate is overvalued relative to trend, reserve growth and export growth are low, and the ratios of the current account deficit to GDP and external debt to reserves are high. The estimated coefficients from the model can then be used to generate predictions in the form of the probability of a crisis occurring in any one country during the next 24 months, given the current values of the explanatory variables.[3] Predicted probabilities above a certain threshold (typically taken in the literature as either 25 or 50 percent) indicate that the model is signaling the likelihood of a crisis (assuming

---

[1] The countries include the six IMF members of the ECCU (Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines), the ECCU as a whole, and four non-ECCU Caribbean countries (Barbados, Guyana, Jamaica, and Trinidad and Tobago).

[2] Data are taken from: real bilateral exchange rate, external reserves, current account, gross domestic product, and exports (IMF, IFS); external debt (Bank for International Settlements, Eastern Caribbean Central Bank, and IMF staff). For each of the ECCU countries and for the Union as a whole, the total external reserves of the Union are used in the calculations of the model.

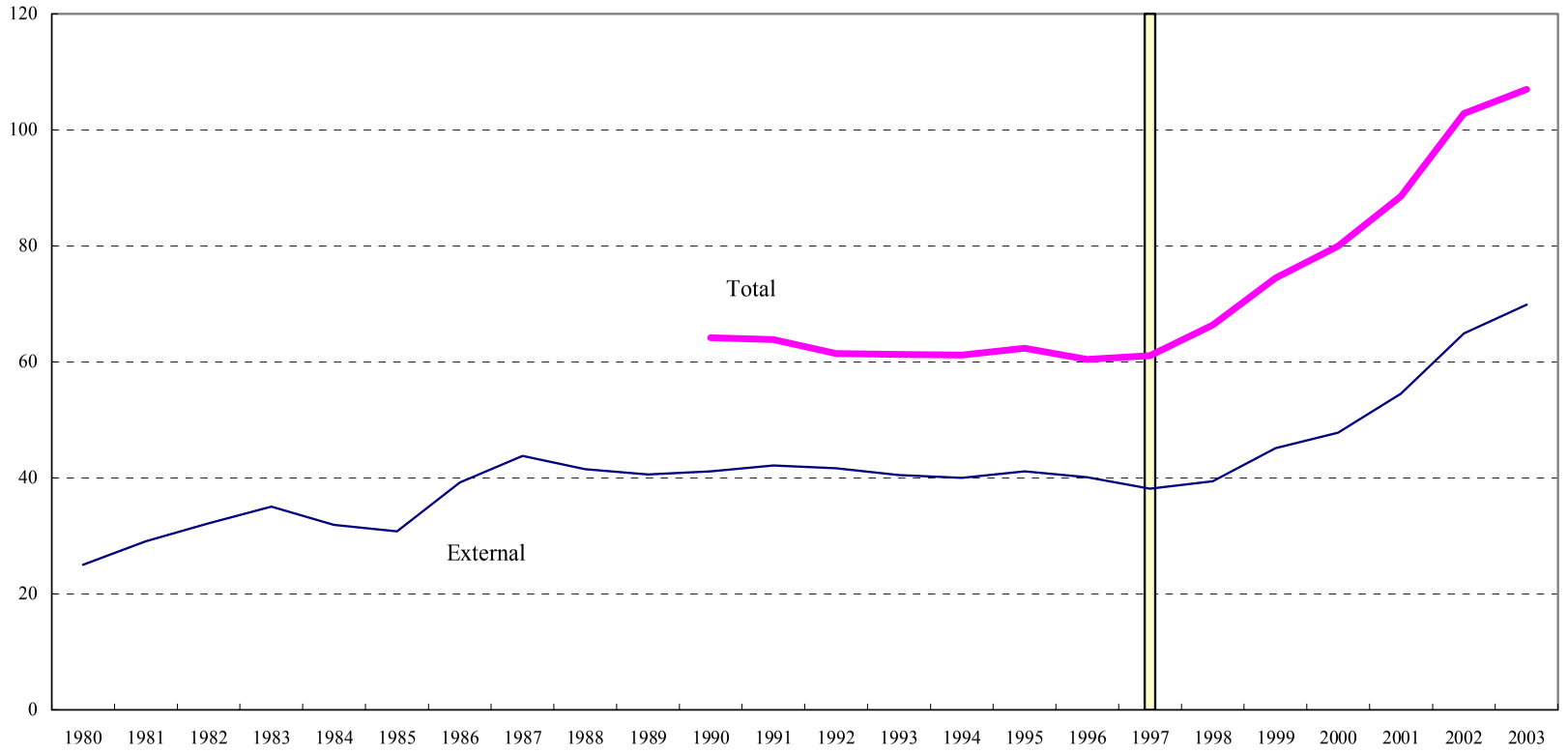
[3] The coefficients from the probit model and the updated independent variables are used to generate out-of-sample predicted probabilities of crisis for the period 2000:8–2003:10.

unchanged policies) within the next 24 months.[4] In effect, the signaling of an imminent crisis is tantamount to the model indicating that under unchanged policies, the path of external imbalances is unsustainable. Of course, a crisis may not eventuate if appropriate policy actions are taken to address the underlying economic problems.

The estimated crisis probability for the six ECCU countries (as a whole) peaked in late-1997 and again in late-1999 (see Appendix Figure V.1). However, since mid-2000 the ECCU crisis probability has remained relatively low at around 10 percent. It should be noted, however, that the figure for the Union as a whole masks significant differences in crisis probability across individual countries.

[4] The threshold probability for an alarm that minimizes a loss function equal to the weighted sum of false alarms (as a share of total tranquil periods) and missed crises (as a share of total pre-crisis periods) is 18 percent for the 35 country sample used in this study.

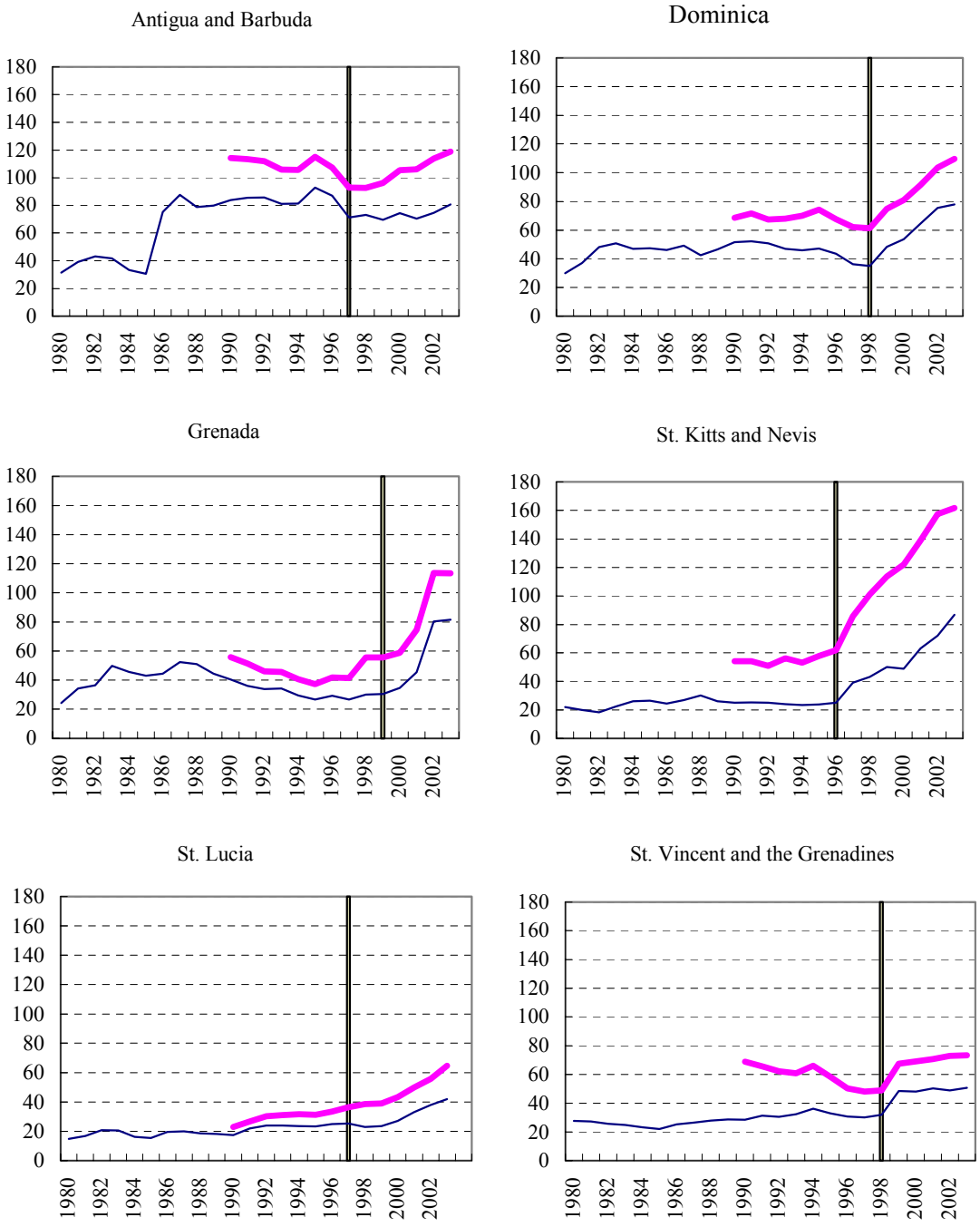
Figure V.1. ECCU: Public Debt, 1980–2003 1/
(Percent of GDP)



Sources: Country authorities; and Fund staff estimates.

1/ Refers to the ECCU countries that are members of the IMF: Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. For both total and external debt, the ECCU debt-to-GDP ratio is the simple average of the country-specific debt-to-GDP ratios.

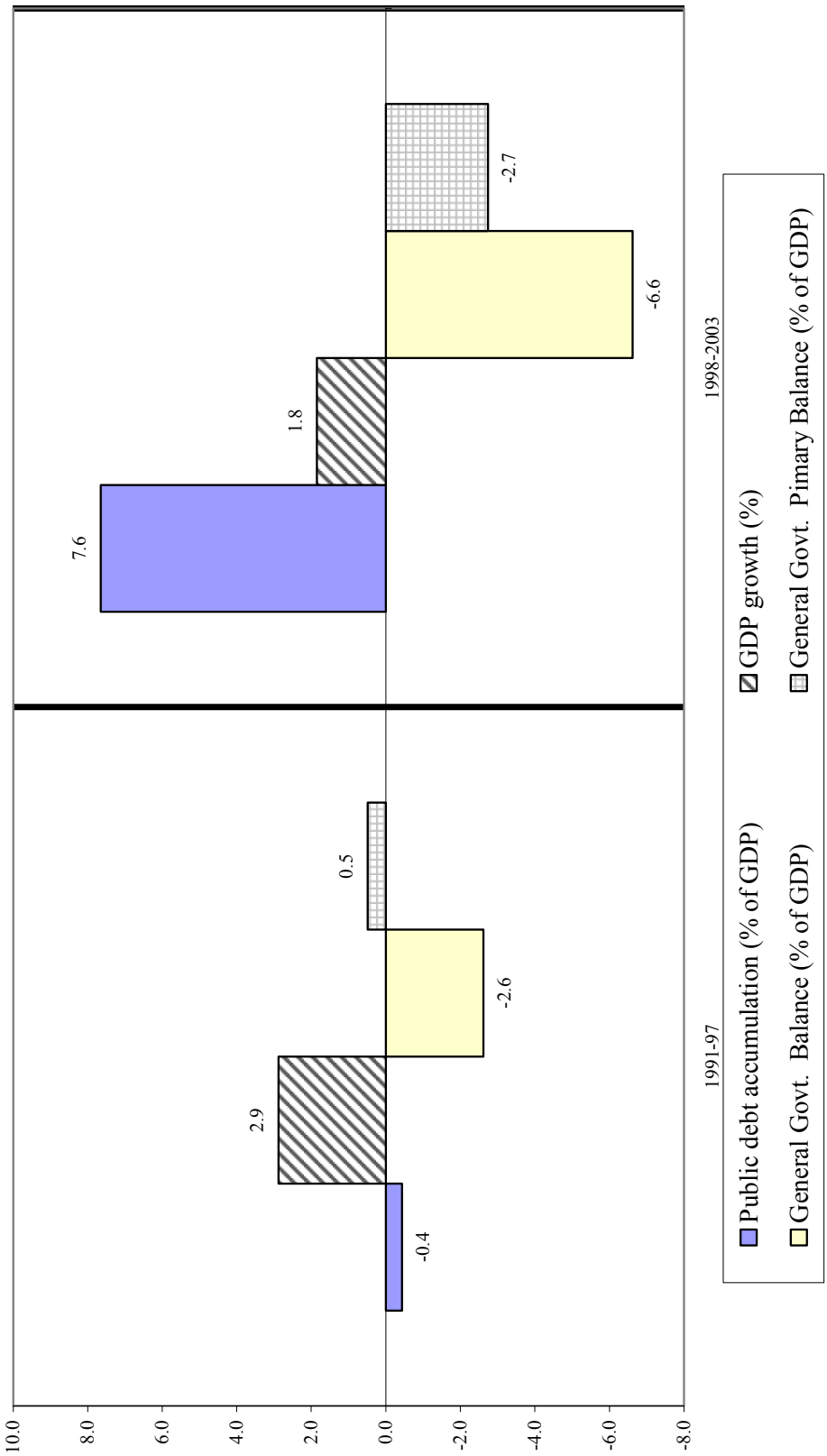
Figure V.2. ECCU: Public Debt, Total and External, 1980–2003
(Percent of GDP)



Total Debt: Thick Line
External Debt: Thin Line

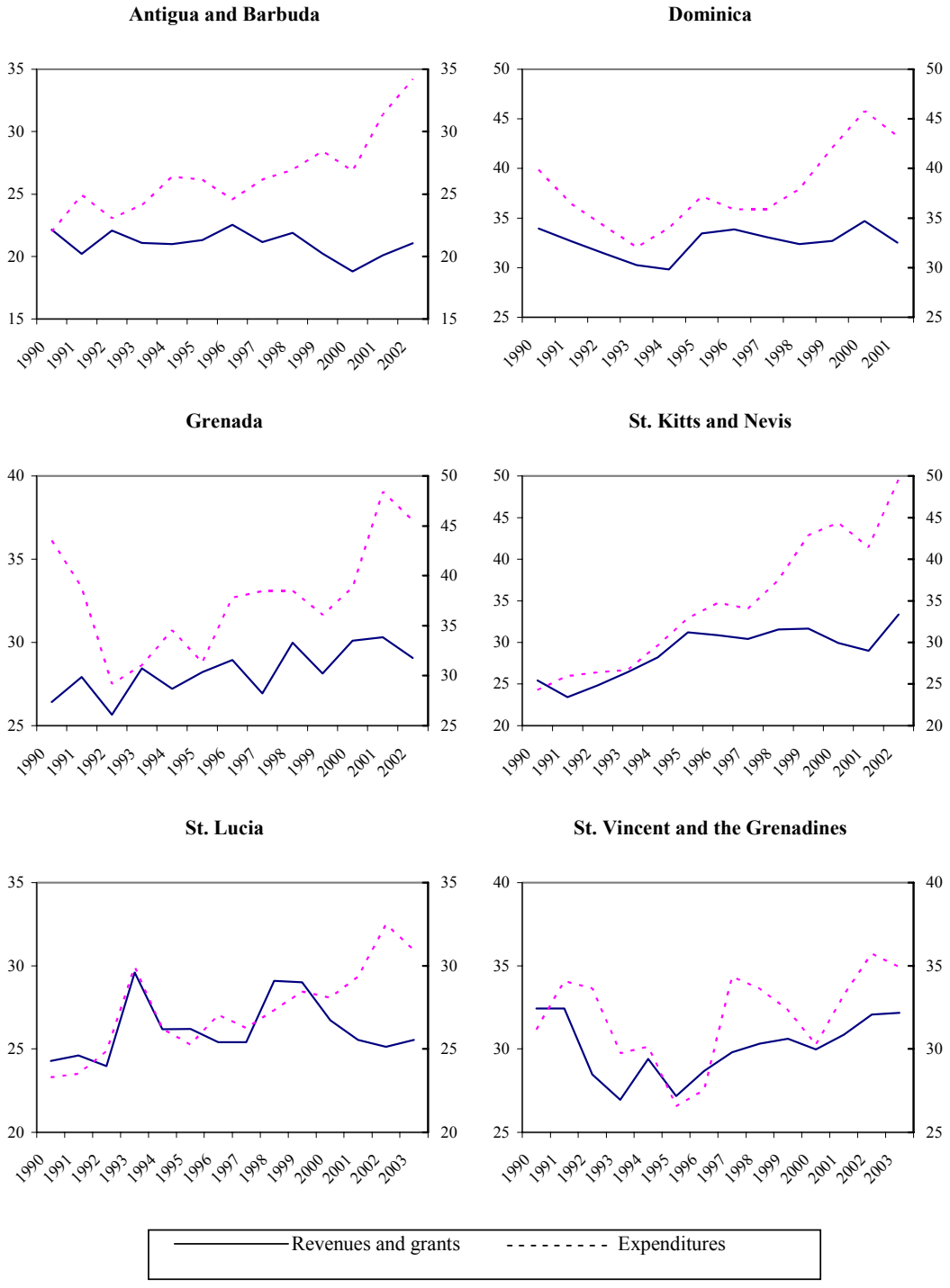
Sources: Country authorities; and Fund staff estimates.

Figure V.3. ECCU: Selected Macroeconomic Indicators
(Yearly Averages)



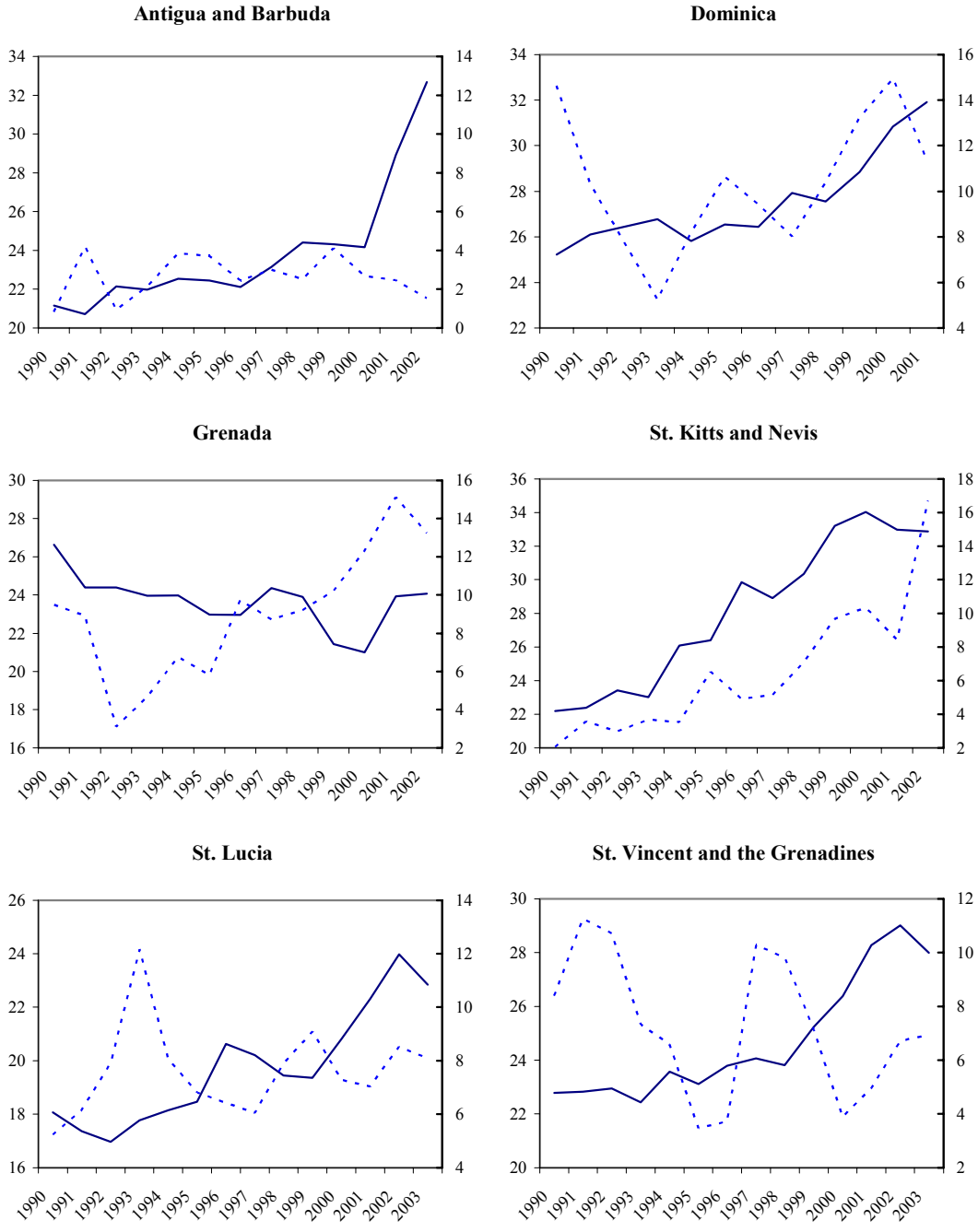
Sources: Country authorities; and Fund staff' estimates.

Figure V.4. ECCU: Central Government Revenues and Expenditures
(Percent of GDP)



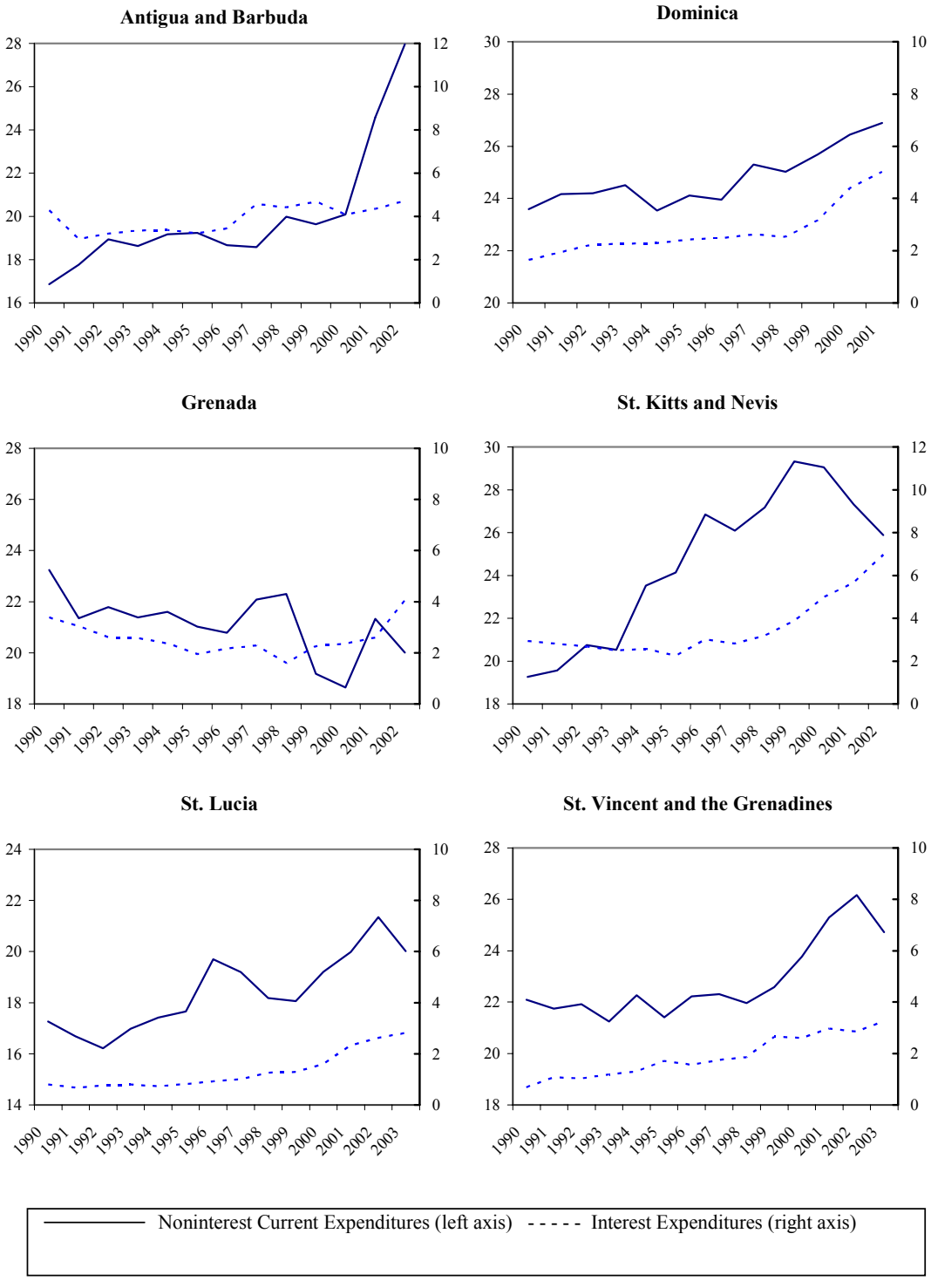
Sources: Country authorities; and Fund staff estimates.

Figure V.5. ECCU: Composition of Central Government Expenditures
(Percent of GDP)



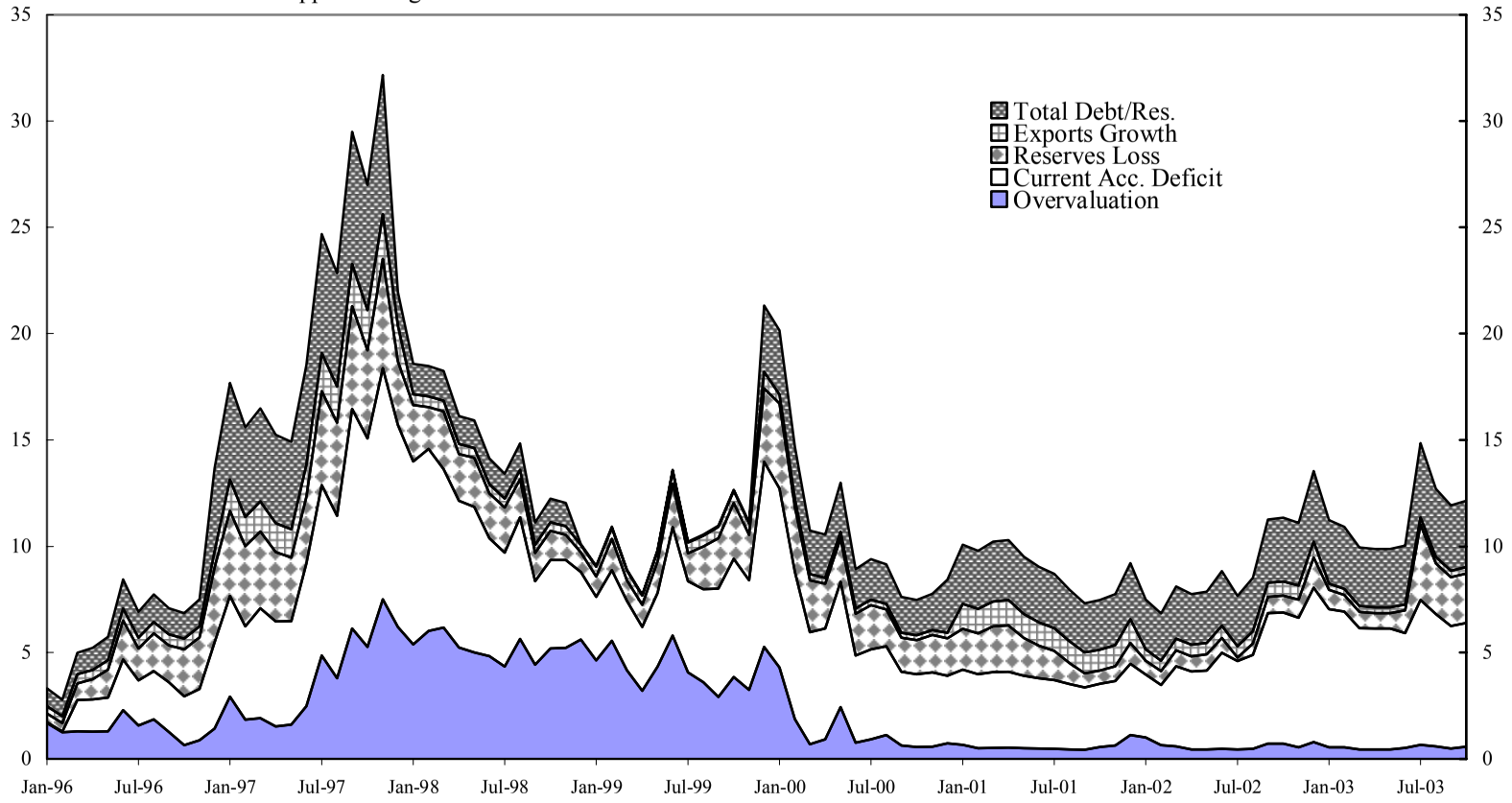
Sources: Country authorities; and Fund staff estimates.

Figure V.6. ECCU: Current Expenditures of the Central Government:
Interest Versus Noninterest
(Percent of GDP)



Sources: Country authorities; and Fund staff estimates.

Appendix Figure V.1. ECCU: Contribution of Variables to DCSD Crisis Probabilities 1/



1/ The probability of a currency crisis over the next 24 months, estimated using the Fund's DCSD model of Berg and Patillo (1999).

Table V.1. ECCU: Exports of Goods and Services

(Percent changes)

	1991–1997	1998–2003	2001–2002	Period 1998–2003 Minus Period 1991–1997
Antigua and Barbuda	12.5	3.3	3.1	-9.2
Dominica	6.4	-0.4	-6.8	-6.8
Grenada	3.4	7.0	-8.6	3.6
St. Kitts and Nevis	9.0	6.6	7.6	-2.3
St. Lucia	3.4	1.3	-5.2	-2.1
St. Vincent and the Grenadines	2.6	3.3	-1.8	0.7

Sources: WEO database; and Fund staff estimates.

Table V.2. ECCU: Total Public Sector Debt Accumulation by Components

(Magnitudes are in percent of GDP, simple averages calculated from individual countries' figures)

			Contribution to Growth of the Public Debt to GDP Ratio					
Year	Total Public Debt to GDP (%) 1/	Public Debt Accumulation	Fiscal Primary Balance (Excl. Grants)	Grants	Interest-Output Difference Effect	Price Effect	Events	Unexplained Component
1991	63.8	-0.3	3.3	-2.7	1.7	-2.1	0.0	-0.5
1992	61.5	-2.4	1.1	-1.5	1.3	-2.1	0.0	-1.1
1993	61.3	-0.2	0.4	-1.6	1.3	-1.2	0.0	0.8
1994	61.2	-0.1	1.5	-1.5	1.2	-2.2	0.0	0.9
1995	62.3	1.2	-0.2	-1.2	2.3	-1.8	0.0	2.0
1996	60.5	-1.9	-0.2	-1.3	0.6	-1.9	0.0	0.9
1997	61.1	0.6	1.7	-1.2	0.3	-1.3	-0.7	1.9
1998	66.3	5.3	2.7	-2.2	0.2	-1.7	0.0	6.2
1999	74.5	8.1	4.2	-1.9	0.1	-0.8	2.9	3.6
2000	79.9	5.5	4.8	-2.0	1.1	-0.3	0.0	1.9
2001	88.5	8.6	5.8	-2.3	4.6	-1.7	0.0	2.3
2002	102.9	14.3	8.0	-2.1	4.9	-1.8	1.9	3.4
2003	107.0	4.1	3.5	-2.0	3.8	-1.7	0.0	0.5
Average (2001–02)		11.5	6.9	-2.2	4.8	-1.8	1.0	2.8
Average (1991–97)		-0.4	1.1	-1.6	1.2	-1.8	-0.1	0.7
Average (1998–2003)		7.6	4.8	-2.1	2.5	-1.3	0.8	3.0
Period 1998–2003 minus period 1991–97		8.1	3.7	-0.5	1.2	0.5	0.9	2.2

Source: Authors' calculations.

Note: A positive sign means that the component contributed to an increase in the public debt to GDP ratio, while a negative sign means that it contributed to a decline of the public debt to GDP ratio.

1/ Simple average of the country-specific debt-to-GDP ratios.

Table V.3. ECCU: Importance of the "Unexplained Component" to Account for Public Sector Debt Accumulation

(Magnitudes are in percent of GDP)

		Contribution to Growth of Debt to GDP Ratio							
Year	Total Public Debt to GDP (%)	Public Debt Accumulation	Fiscal Primary Balance (Excl. grants)	Grants	Interest-Output Difference Effect	Price Effect	Events	Unexplained Component	Unexplained Over Total Accumulation (%)
Antigua and Barbuda									
Average (1991–97)		-3.1	-1.5	-0.4	3.8	-2.9	-1.9	-0.2	5.8
Average (1998–2003)		4.4	4.0	-0.6	1.3	-1.2	0.0	0.8	18.9
Period 1998–2003 minus period 1991–97		7.4	5.5	-0.2	-2.4	1.7	1.9	1.0	13.5
Dominica									
Average (1991–97)		-0.9	2.7	-2.0	0.7	-2.3	0.0	-0.1	11.7
Average (1998–2003)		8.0	8.3	-4.4	5.4	-1.0	0.0	-0.4	-4.9
Period 1998–2003 minus period 1991–97		8.9	5.6	-2.4	4.7	1.2	0.0	-0.3	-3.2
Grenada									
Average (1991–97)		-2.1	3.5	-2.9	1.3	-1.3	0.0	-2.7	129.0
Average (1999–2003)		12.0	7.0	-3.0	1.4	-0.8	1.9	5.4	45.2
Period 1998"2003 minus period 1991–97		14.0	3.5	-0.2	0.2	0.6	1.9	8.1	57.5
St. Kitts and Nevis									
Average (1991–97)		4.5	0.4	-0.7	0.1	-1.8	1.3	5.2	116.3
Average (1998–2003)		12.7	7.2	-1.0	2.3	-2.9	0.0	7.1	56.2
Period 1998–2003 minus period 1991–97		8.2	6.8	-0.3	2.2	-1.1	-1.3	1.9	23.3
St. Lucia									
Average (1991–97)		1.9	1.5	-1.6	0.7	-0.7	0.0	2.0	103.0
Average (1998–2003)		4.7	2.1	-2.1	2.3	-1.0	0.0	3.4	72.7
Period 1998–2003 minus period 1991–97		2.8	0.6	-0.6	1.6	-0.3	0.0	1.5	52.0
St. Vincent and the Grenadines									
Average (1991–97)		-3.0	-0.1	-1.9	0.8	-1.8	0.0	0.0	-1.3
Average (1998–2003)		4.2	0.4	-1.4	2.0	-1.0	2.9	1.3	31.3
Period 1998–2003 minus period 1991–97		7.2	0.5	0.5	1.2	0.7	2.9	1.3	17.8

Source: Authors' calculations.

Note: A positive sign means that the component contributed to an increase in the public debt to GDP ratio, while a negative sign means that it contributed to a decline of the public debt to GDP ratio.

Table V.4. Natural Disasters in ECCU Countries, 1990–2002

Country	Year	Event	Total Persons Affected	Estimated Damage (% of GDP)
Antigua and Barbuda	1990	Hurricane Gustav	...	...
Antigua and Barbuda	1995	Hurricane Luis	68,702	0.1
Antigua and Barbuda	1998	Hurricane Georges	2,025	...
Antigua and Barbuda	1999	Hurricane Jose	2,534	...
Antigua and Barbuda	1999	Hurricane Lenny	3,423	...
Dominica	1995	Hurricane Luis	3,001	1.6
Dominica	1999	Hurricane Lenny	715	...
Dominica	2001	Hurricane Iris	175	...
Grenada	1990	Tropical Storm Arthur	1,000	...
Grenada	1999	Hurricane Lenny	210	1.5
St. Kitts and Nevis	1990	Hurricane Gustav	...	...
St. Kitts and Nevis	1995	Hurricane Luis	1,800	85.4
St. Kitts and Nevis	1998	Hurricane Georges	10,000	...
St. Kitts and Nevis	1999	Hurricane Lenny	1,800	13.6
St. Lucia	1994	Tropical Storm Debby	750	...
St. Lucia	1996	Landslide	175	...
St. Lucia	1999	Hurricane Lenny	200	...
St. Vincent and the Grenadines	1992	Flood	200	...
St. Vincent and the Grenadines	1999	Hurricane Lenny	100	...
St. Vincent and the Grenadines	2002	Hurricane Lili	...	...

Source: International Monetary Fund (2004).

Notes: Natural Disasters are here defined as events due to natural causes that caused 10 or more fatalities, affected 100 or more people, or resulted in a call for international assistance or the declaration of a state of emergency.

REFERENCES

Berg, A., and C. Pattillo, 1999, "Predicting Currency Crises: The Indicators Approach and an Alternative," *Journal of International Money and Finance*, Vol. 18, pp. 561–86.

Helbling, T., A. Mody, and R. Sahay, 2003, "Debt Accumulation in the CIS-7 Countries: Bad Luck, Bad Policies, or Bad Advice," (unpublished manuscript, International Monetary Fund, Washington, DC).

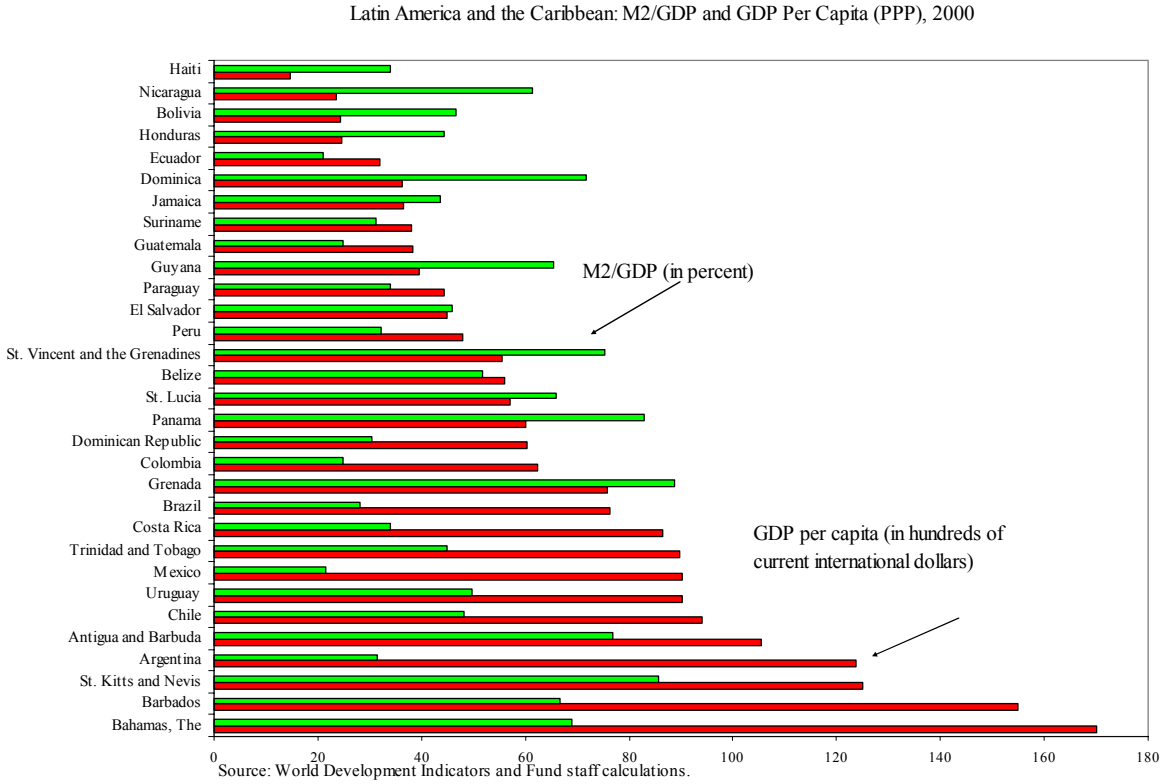
International Monetary Fund, 2003, "Public Debt in Emerging Markets: Is It Too High?," in *World Economic Outlook (September 2003)*, International Monetary Fund, Washington, DC.

International Monetary Fund, 2004, "Natural Disasters and the Macroeconomic Implications," in *Eastern Caribbean Currency Union: Selected Issues*, Chapter II.

VI. THE ROLE OF THE BANKING SECTOR IN THE ECCU[1]

A. Introduction

1. **Financial systems in the small, open economies of the Eastern Caribbean Currency Union (ECCU) are relatively deep, albeit inefficient, compared with other Latin American and Caribbean countries at a similar level of development.** The average ratio of broad money to GDP, an indicator of the degree of monetization, increased from 80 percent at end-2000 to 92 percent at end-2002. Monetization in Antigua and Barbuda and St. Kitts and Nevis was more than double the levels in Argentina, Chile or Uruguay at end-2000, despite similar levels of GDP per capita (in purchasing power parity terms). However, despite the sharp decline in international and U.S. deposit rates since 2001, there has been limited interest rate flexibility in the ECCU. The spread between lending and deposit rates has averaged about 8 percent, which is relatively high for the degree of monetization (Lynch, 1996).



2. **Resource mobilization is mostly undertaken by onshore banks, near-banks (chiefly credit unions), and by the partly-funded national insurance systems (or social security boards in some countries)**. The latter two groups account for about 25 percent and

[1] Prepared by Jingqing Chai.

15 percent of total financial assets in the region, respectively. About 40 percent of the resources mobilized by the national insurance systems are invested in bank deposits, mainly in locally-owned banks, with the remainder fairly evenly divided among government securities, foreign investments, other local investments, and "other assets" (Van Beek et. al, 2000).

3. **Despite their small size, each ECCU country has at least four banks, two or more of them part of a foreign-owned international banking group**. Foreign-owned banks have over 55 percent of the union-wide market (measured by bank loans). The foreign banks are branches of banks based in Barbados, Canada, and Trinidad and Tobago. Of the locally- owned banks, four are fully or majority government-owned and account for 15 percent of the union-wide market.

4. **This chapter examines the role of the banking sector in allocating financial resources within the ECCU, specifically its links to other sectors of the economy**. The chapter uses banks' balance-sheet data which has been compiled, although not necessarily verified, by the Eastern Caribbean Central Bank (ECCB). Section B examines the linkages of the banking sector with the real sector of the economy, including the magnitude and composition of banks' credit allocations. Section C focuses on the links with the public sector, including the implications of large fiscal imbalances and high public sector debt for financial intermediation and risk. Section D draws a number of policy conclusions that could enhance the efficiency of financial intermediation in the ECCU.

B. Banking Sector Links to the Real Sector

5. **Apart from foreign direct investments and other large projects, bank credit remains the main form of funding for the private sector.** Capital markets in the region—the Regional Government Securities Market (RGSM) and the Eastern Caribbean Securities Exchange (ECSE)—are at an early stage of development, with few issues and small market capitalization (apart from a handful of government and public enterprise securities). Thus the private sector has to rely for additional capital on the domestic financial system—chiefly the banking system—as credit from nonbank financial institutions is mostly member-based and small in size. The small capital base of most domestic banks means that large projects, including foreign direct investments, cannot be funded by domestic banks without violating exposure limits. Therefore, such projects are typically financed either by foreign banks directly or through foreign branches operating in the region, which typically have better access to lower-cost funding.

6. **Despite a reduction in the minimum saving deposit rate from 4 percent to 3 percent in September 2002, deposits with the banking sector have risen** (Figure VI.1). Savings and time deposits contributed to most of the deposit growth, except in Antigua and Barbuda and St. Kitts and Nevis, where foreign currency deposits have played a bigger role than saving deposits. Nonresident deposits as a share of total deposits have increased somewhat in three ECCU countries since 1997, and on average they account for around 12 percent of total deposits at end-September 2003 (Figure VI.2).

7. **In recent years, private sector credit growth has lagged behind deposit growth with a declining trend consistent with the sluggish level of economic activity** (Figure VI.1). In Dominica, St. Kitts and Nevis, and St. Lucia, periods of negative credit growth occurred. Where there has been some positive credit growth, it was mostly explained by growth in loans to households, mainly housing related.

8. **Personal loans account for on average half of the total bank loans, and, in four of the six ECCU countries, its importance in banks' loan portfolios has increased since 1996** (Table VI.1).[2] Personal loans principally comprise loans to finance the acquisition of property and other personal lending, which includes credit cards, travel, and education. Growth in other loans has increased particularly rapidly since 1996, most notably in Grenada and St. Lucia. Housing loans are backed by property with varying degree of coverage, and banks tend to hold these loans to maturity, although they have the option to sell their primary mortgages to the Eastern Caribbean Home Mortgage Bank.

9. **Distributive trade and public administration are the second-largest recipients of bank credit, each receiving on average 10–11 percent of total bank loans** (Table VI.1). Compared with end-1996, however, the relative importance of distributive trade has fallen in most ECCU countries, while that of public administration has increased, as ECCU governments have increased direct borrowing (i.e., bank loans and overdraft) from the banking systems.

10. **Tourism and agriculture, two of the leading growth sectors in the region, receive relatively small shares of the banking system credit** (Table VI.1). Excluding St. Lucia, where tourism accounted for a bigger share than public administration, ECCU countries had only about 5 percent of bank credit allocated to tourism as of end-2002. In four countries, the relative share of tourism credit has actually declined since 1996. Agriculture, vital to rural livelihoods in almost all of the ECCU countries, receives less than 2 percent of bank credit. A noticeable exception is St. Kitts and Nevis, where the large share in credit is accounted for by credit to the sugar company. While it varies with each country, it seems that the agriculture sector has relied on a mixture of self-financing, rural cooperatives, and government agriculture diversification programs (some of which are funded by the European Union).

C. Fiscal-Financial Linkages and Vulnerabilities

11. **As public sector debt surged since the mid-1990s, banking systems' gross exposures to the home country public sector built up quickly, and exceeded capital for locally-incorporated banks** (Table VI.2). While these exposures have not grown unduly large relative to total bank assets—except in St. Kitts and Nevis where over half of banking system's assets are loans and advances to the public sector—in all but two ECCU countries,

[2] Some personal loans are used for productive purposes, for example, a car loan with a partial use as taxi, or a mortgage loan with a partial rental use.

the share of public sector exposures in total assets has doubled since 1996. Moreover, in all six ECCU countries, locally-incorporated banks have on aggregate gross exposures to government that exceed their total capital, and by a large margin in four countries. The majority of these exposures and their increases over the years are accounted for by government borrowing, except in St. Kitts and Nevis, where both the government and public enterprises have more than doubled their borrowings from the banking system since 1996.

12. **Banks' investments in home government treasury bills may play a more important role, with the increasing use of the RGSM.** Treasury bills amounted to 14 percent of total gross government credit as of end-September 2003, excluding St. Kitts and Nevis, where some banks routinely pool resources from their sister-branches in the region for securities investment, resulting in 72 percent of the total gross government credit taking the form of home government treasury bills. However, since the launch of the RGSM, in countries where treasury bills were issued in the RGSM, banks' exposures to home country treasury bills have varied considerably, depending on the auction outcome. It is also more likely that banks increase their exposures to other ECCU countries' governments through the RGSM, as an effort to place excess liquidity.

13. **Public sector deposits—mostly by national insurance systems but, in some cases, by governments—are a key source of liquidity for banking systems** (Table VI.2). Deposits by national insurance systems vary from 2.5 percent of total banking assets in Antigua and Barbuda to 35.8 percent in St. Kitts and Nevis. In Antigua and Barbuda, public enterprises are the main depositors in the banking system, amounting to 18 percent of the total banking assets. Deposits by the government are also important in St. Vincent and the Grenadines and in St. Kitts and Nevis, amounting to 15–16 percent of the total banking assets. However, some proportion (ranging from 15 percent to 40 percent) of government deposits with the banking systems are donor-financed project funds, whereby their use is linked to project execution. As a result, banks' net exposures to the public sector range from a net debt in the case of St. Lucia and St. Vincent and the Grenadines, the two countries with the lowest debt burden, to a net credit of 23.1 percent of assets in the case of St. Kitts and Nevis, despite the large contribution from the social security board.

14. **The funding linkage between banks and the public sector has implications for financial and fiscal risk management**. The banking systems in the region fund on a gross basis about 20 to 35 percent of the public sector debt, although the contribution of banking systems' financing to public sector debt has declined slightly recently, as governments made increasing recourse to external borrowing (Figure VI.3). A change in banks' risk assessments of government financing or a bank failure resulting in loan recalls could create an interruption in financing of government deficits. On the other hand, if governments sharply draw down deposits, it might create a liquidity shortage for locally-incorporated banks. Isolated incidents may not be much of a concern, as foreign banks and/or the ECCB may provide the needed liquidity, but a systemic disconnection of such a link could be destabilizing.

15. **Weak domestic banking sectors potentially represent a substantial contingent fiscal liability to ECCU governments**.[3] Resident private sector deposits in indigenous banks are around 50 percent of GDP, except in Grenada where they exceed 80 percent. The deposits of the national insurance systems, concentrated in the indigenous banks, particularly those which are government-owned, are substantial relative to their assets (e.g., deposits account for about half of the National Insurance Scheme assets in St. Vincent and the Grenadines). As such, the failure of an indigenous bank—particularly one that is government owned—could create a substantial fiscal obligation.

D. Policy Implications and Conclusions

16. **Banking systems in the ECCU increasingly lend to households and the public sector, reflecting in part the sluggish activity in the private business sector.** The weakness of private sector activities has persisted as a result of external shocks and negative shifts in the trade regime. It has also prompted ECCU governments to pursue countercyclical fiscal policy, which in turn draws greater bank resources into the public sector.

17. **In addition to the lack of "bankable" business projects, structural weaknesses in ECCU banking systems have also contributed to the banks' retrenchment in lending to the private business sector**. These weaknesses include, among others: limitations in prudential capital calculations (which encourage lending to public sectors); weaknesses in risk management capabilities (witnessed by high nonperforming loans (NPLs));[4] and legal impediments to prompt resolutions of bad loans.

18. **Additional measures aimed at improving the institutional framework and reducing vulnerabilities are needed to enable ECCU banks to play a more efficient role in financial intermediation.** These measures may include:

- **Strengthening banking supervision,** including in particular strengthening capital adequacy requirements, applying a more rigorous risk-based program, and enhancing follow-up and enforcement of remedial action. Requirements for banks to account for sovereign risk in provisioning and capital adequacy calculations will help mitigate their vulnerability, given their large exposures to the government.

- **Improving risk management capabilities**. The current concern for NPLs underscores the severity of the problems commercial banks face in credit risk management. Measures such as instituting a system of credit rating of clients and a

[3] Banking sector risks appear concentrated in locally-incorporated banks. The ECCB has placed local banks accounting for about 40 percent of ECCU banking assets on its watch list.

[4] NPL ratios are over 20 percent for many local banks, and may be even higher if government arrears are accounted for in some countries, such as Antigua and Barbuda.

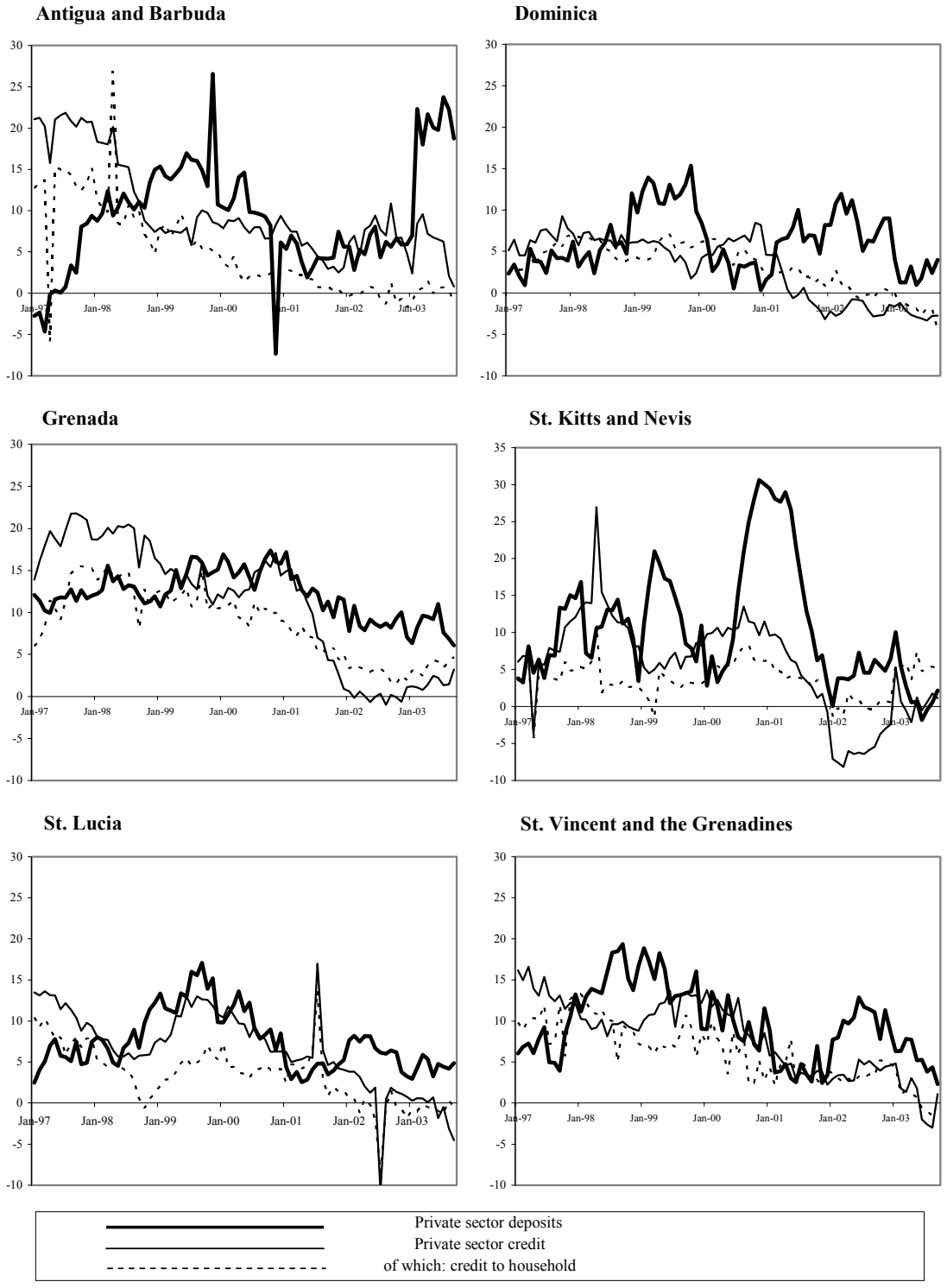
network of information sharing among banks help improve loan quality and allow for a more efficient use of loan rates for risk management.

- **Establishing fair and expeditious legal procedures so as to create a debt repayment culture and to reduce the incidence of delinquency.** In some ECCU countries, there exist legal impediments to the process of resolving bad assets. For example, where a court procedure requires three bidders for a foreclosed property, forestalling is created when a special-interest party bids prohibitively high.

- **Revisiting the present policy of a savings rate floor**. A detailed study of the impact of the legislated floor on the savings rate is needed in order to weigh the possible positive effect on savings and deposit inflow against the possible negative effect on lending rates. While the evidence is mixed on whether the savings floor (at present 2 percentage points higher than the U.S. saving rate) has induced an inflow of non-resident deposits (Figure VI.2), the concern over the high cost of capital—real lending rates have been above 10 percent—warrants a closer study.

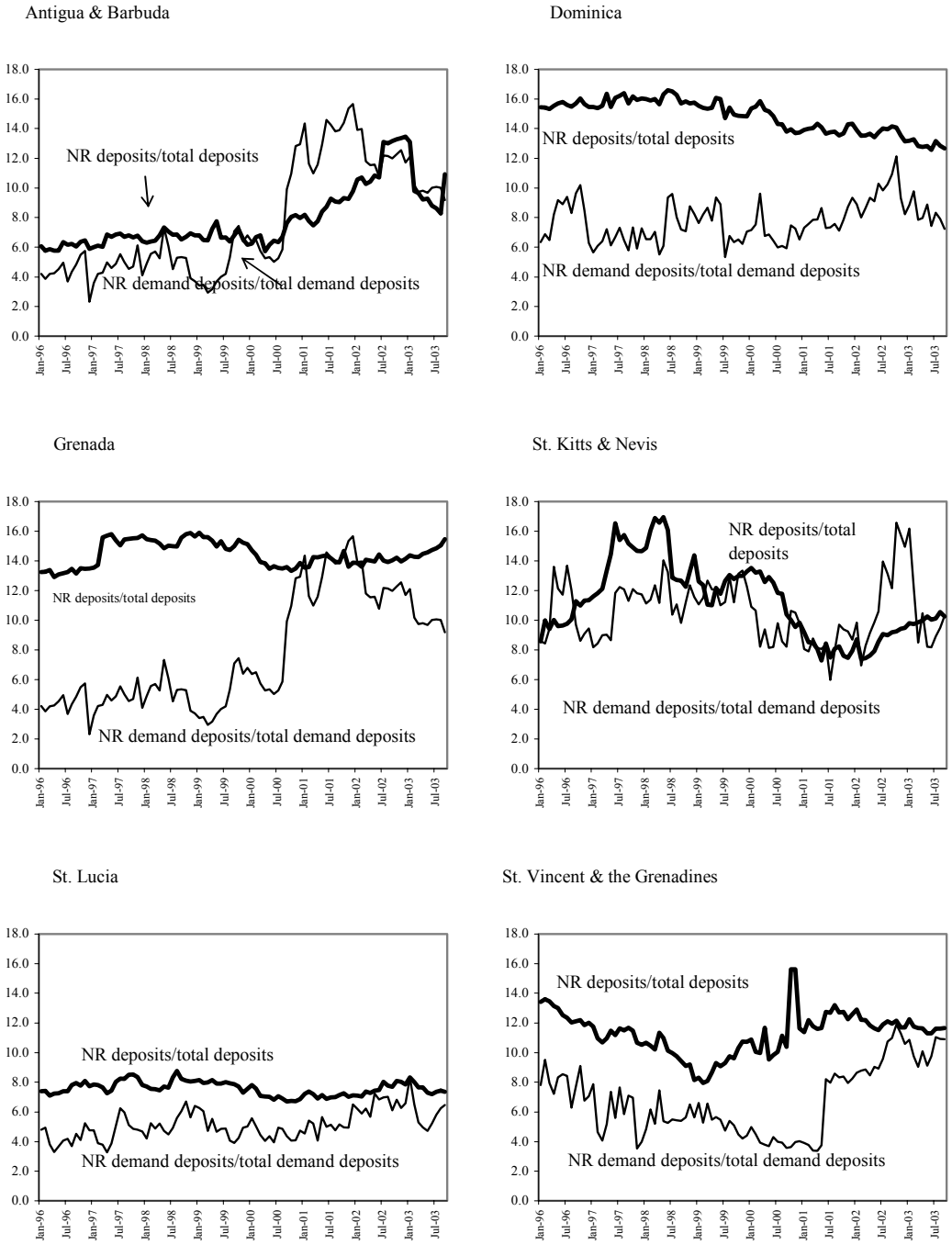
- **Deepening the regional financial market to facilitate the financing of large projects**, **while simultaneously strengthening supervision to guard against the risk of overly aggressive banking behavior**. There is little banking integration in the ECCU region at present, although syndicated loans have begun to emerge. Given the presence of vigilant banking supervision, broadening the financing base of the region will help diversify risks beyond national borders.

Figure VI.1. ECCU: Private Sector Deposits and Credit, 1997-2003
(12-month percentage change)



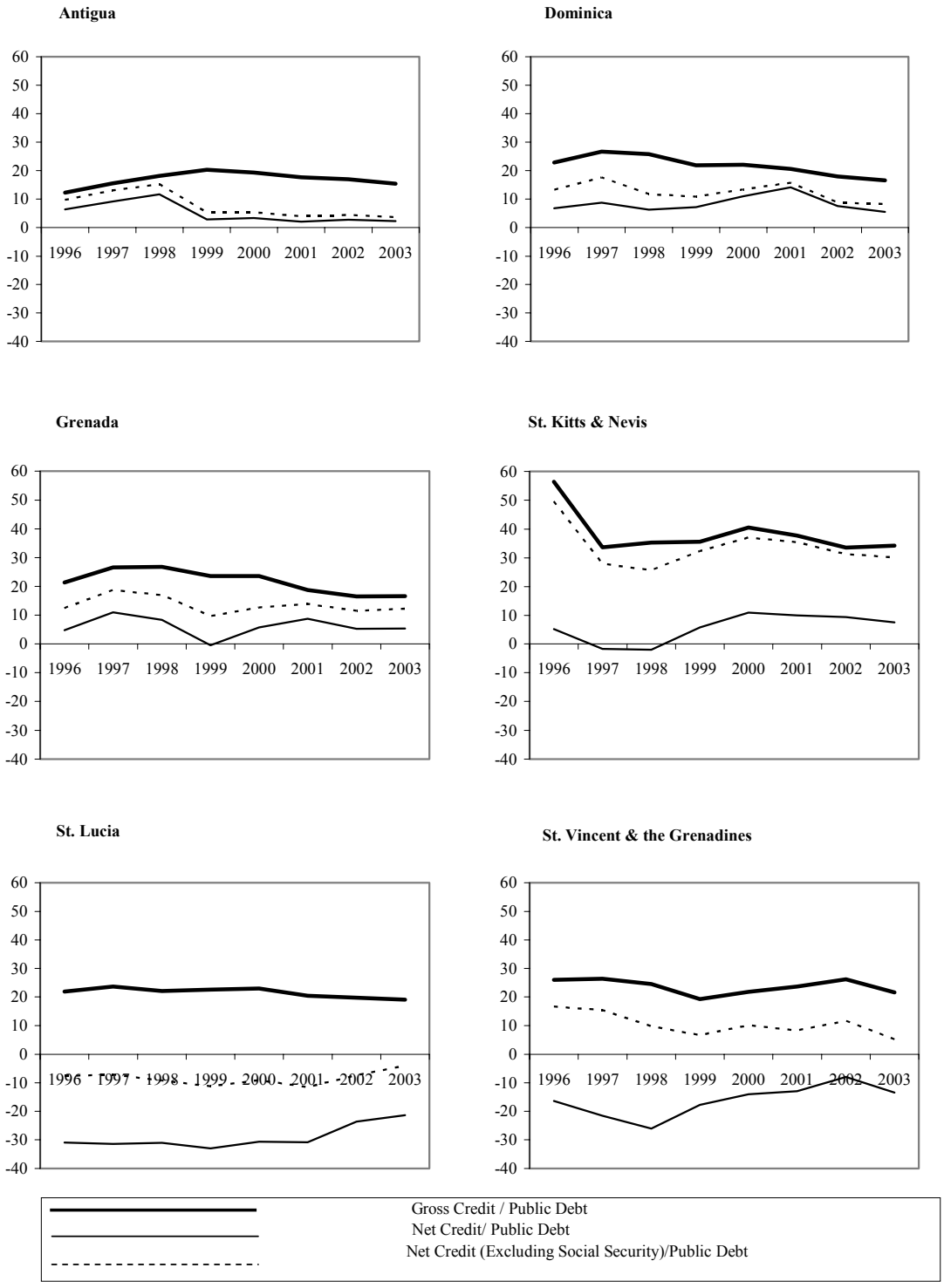
Source: ECCB and Fund staff calculations.

Figure VI.2. ECCU: Non-Resident (NR) Deposits, 1996-2003 1/
(in percent)



Source: ECCB and Fund staff calculations.
1/ End September figures for 2003.

Figure VI.3. ECCU: Banking System's Financing of Public Debt, 1996-2003 1/
(in percent of total public debt)



Source: ECCB and Fund staff calculations.
1/ End-September figures for 2003.

Table VI.1. ECCU: Commercial Banks' Credit Allocation by Economic Activity
(in percent of total)

	Antigua & Barbuda		Dominica		Grenada		St. Kitts & Nevis		St. Lucia		St.Vincent & Grenadines	
	1996	2002	1996	2002	1996	2002	1996	2002	1996	2002	1996	2002
Agriculture	**0.3**	**0.4**	**1.0**	**1.9**	**1.9**	**1.7**	**8.3**	**19.9**	**3.8**	**1.8**	**4.4**	**1.9**
Sugar	0.0	0.1	0.0	0.0	0.0	0.0	8.1	19.6	0.1	0.0	0.0	0.0
Tree Crops	0.0	0.0	0.8	1.7	1.5	1.3	0.0	0.0	2.9	0.6	3.9	1.2
Livestock & dairying	0.2	0.1	0.1	0.0	0.3	0.2	0.1	0.0	0.3	0.5	0.0	0.0
Food Crops	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0
Forestry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.5	0.5	0.6
Fisheries	**0.1**	**0.1**	**0.0**	**0.0**	**0.4**	**0.4**	**0.0**	**0.1**	**0.1**	**0.3**	**0.2**	**0.1**
Mining & Quarrying	**0.2**	**0.3**	**1.2**	**1.2**	**0.1**	**0.2**	**0.1**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**
Manufacturing	**3.1**	**2.6**	**8.6**	**3.4**	**5.4**	**3.2**	**3.2**	**2.0**	**3.3**	**3.1**	**6.7**	**2.4**
Utilities	**0.4**	**1.6**	**3.8**	**6.9**	**6.3**	**2.9**	**2.7**	**1.8**	**1.8**	**2.2**	**0.4**	**0.2**
Construction & Land Development	**4.6**	**7.0**	**3.1**	**2.8**	**3.3**	**2.7**	**12.3**	**3.9**	**3.3**	**6.4**	**6.1**	**2.8**
Distributive Trade	**14.4**	**11.5**	**18.0**	**14.2**	**16.3**	**7.9**	**10.4**	**11.7**	**15.0**	**12.4**	**12.0**	**11.2**
Tourism	**10.0**	**8.1**	**3.4**	**4.0**	**11.0**	**5.3**	**4.8**	**5.2**	**12.2**	**11.1**	**5.5**	**3.8**
Entertainment	**1.9**	**1.3**	**0.6**	**0.5**	**0.9**	**1.7**	**2.2**	**0.5**	**1.0**	**1.3**	**1.0**	**1.0**
Transport	**2.1**	**1.6**	**2.7**	**3.7**	**5.0**	**7.1**	**1.1**	**0.5**	**3.6**	**1.9**	**3.8**	**2.7**
Financial Institutions	**0.7**	**2.1**	**4.6**	**0.2**	**0.6**	**0.7**	**0.3**	**0.6**	**0.7**	**0.9**	**1.2**	**1.4**
Professional & Other Services	**5.8**	**7.8**	**4.5**	**3.9**	**3.3**	**3.5**	**4.5**	**3.7**	**6.1**	**7.9**	**2.6**	**4.3**
Public Administration	**13.2**	**12.9**	**12.9**	**14.0**	**3.7**	**5.6**	**14.8**	**10.9**	**4.5**	**6.5**	**10.9**	**13.1**
Personal	**43.1**	**42.7**	**35.7**	**43.5**	**41.8**	**57.3**	**35.2**	**39.2**	**44.5**	**44.0**	**45.0**	**55.0**
Acquisition of Property	21.4	21.7	23.4	26.2	27.3	30.8	22.9	22.0	26.4	18.9	28.1	35.5
Home Const. & Renovation	15.8	13.8	15.1	12.9	20.2	20.2	16.5	15.4	13.6	10.3	22.7	22.8
House & Land Purchases	5.6	7.9	8.3	13.4	7.2	10.6	6.4	6.6	12.8	8.6	5.4	12.7
Durable Consumer Goods	6.2	4.4	2.3	1.7	4.8	3.8	3.8	1.5	5.3	3.7	3.7	2.7
Other Personal	15.5	16.7	10.0	15.5	9.6	22.7	8.5	15.7	12.8	21.4	13.2	16.8
Grand Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: ECCB and Fund staff calculations.

Table VI.2. ECCU: Commercial Banks' Exposures to the Home Country Public Sector 1/
(in percent)

	Antigua and Barbuda		Dominica		Grenada		St. Kitts and Nevis		St. Lucia		St. Vincent and the Grenadines	
	1996	2003	1996	2003	1996	2003	1996	2003	1996	2003	1996	2003
Gross credit/total assets 2/	13.3	25.7	15.6	19.5	8.3	22.8	22.7	54.1	8.0	15.5	13.8	22.7
Gross credit to government/total assets	11.0	20.5	12.5	15.9	6.5	15.5	12.3	27.2	3.4	9.2	10.3	19.0
Gross credit to public enterprises/total assets	2.3	5.2	3.0	3.6	1.9	7.2	10.4	26.9	4.6	6.4	3.5	3.7
Net credit/total assets 2/	7.0	3.8	4.6	6.4	1.8	7.3	2.1	11.9	-11.3	-17.4	-8.7	-14.2
Net credit to government/total assets	9.8	19.2	9.3	6.9	4.7	11.5	10.9	23.1	-2.7	-6.2	8.2	3.1
Net credit to public enterprises/total assets	0.8	-13.0	-0.3	2.8	0.1	5.4	9.0	24.6	-0.1	2.9	0.7	2.3
Net credit to national insurance/total assets	-3.6	-2.5	-4.4	-3.3	-3.0	-9.6	-17.8	-35.8	-8.5	-14.1	-17.5	-19.6
Memorandum item:												
Locally incorporated banks												
Gross public sector exposure/total capital 3/	136.9	184.2	89.2	116.2	150.7	196.0	199.6	260.3	214.5	157.9	220.0	204.1

Source: ECCB and Fund staff calculations.

1/ End-September figures for 2003.

2/ Credit includes treasury bills, other securities, and loans and advances.

3/ For 1996, 1997 figures are used.

References

Lynch, D., 1996, "Measuring Financial Sector Development: A Study of Selected Asia-Pacific Countries," *The Developing Economies*, XXXIV-1, March 1996.

Van Beek, F., J. Rosales, M. Zermeno, R. Randall, and J. Shepherd, 2000, *The Eastern Caribbean Currency Union: Institutions, Performance, and Policy Issues*, IMF Occasional Paper 195, International Monetary Fund, Washington DC.

VII. Regional Integration and Trade Regimes[1]

A. Introduction

1. **The countries of the Eastern Caribbean Currency Union (ECCU), like many other Caribbean countries, rely heavily on international trade.** Traditionally, the production of agricultural goods (sugar and bananas) for foreign markets was the most important economic activity in the region, but in recent years the tourism sector has taken the lead. The countries of the ECCU also import a large share of their consumption needs (including food, manufactured goods, and energy).

2. **Integration initiatives and trade policy are a fundamental part of their development strategy.** The purpose of this chapter is twofold. First, it presents an overview of the recent progress achieved in regional integration. Second, it analyzes an important element of trade policy—protection via tariff and nontariff barriers—and compares the policies of the ECCU with those of other countries in the region.

3. **The rest of the chapter is organized as follows.** Section B deals with regional integration, analyzing the two regional integration initiatives in which the ECCU is currently involved. Section C discusses the trade regimes and trade policy of the ECCU, in particular, the use of tariff and nontariff barriers, and the impact that current tariffs exemptions have on the countries' fiscal accounts. At the end of the chapter, two appendices present accounts of developments in world banana and sugar markets, which are commodities of considerable significance to several ECCU countries.

B. Regional Integration in the ECCU

4. **The members of the ECCU are at the confluence of two distinct forces towards regional integration**. The first involves the smaller group of Caribbean Leeward and Windward Islands (the ECCU countries) which have formed the Organization of Eastern Caribbean States (OECS)[2], while the second covers the wider Caribbean region, the Caribbean Community (CARICOM). A description of the features and previous

[1] Prepared by Esther Suss, Patrick Njoroge, Paul Cashin, and Pedro Rodriguez.

[2] The members of the ECCU are also engaged in external trade negotiations at the multilateral level (Doha Agenda), inter-regional level (Economic Partnership Agreement with the European Union), and Hemispheric level (Free Trade Area of the Americas). This broader agenda of integration is being approached by the countries of the ECCU and CARICOM through a coordination strategy. The OECS members coordinate their joint negotiating position through the OECS Secretariat. In turn, the OECS Secretariat, through the Caribbean Regional Negotiating Machinery (RNM), coordinates these views with those of other CARICOM members, thereby yielding a common position which is presented at trade negotiations by the RNM on behalf of all CARICOM members.

achievements of these regional integration initiatives can be found in IMF (2003).[3] Consequently, this section focuses on the recent achievements and agenda of both the OECS and CARICOM.

The Organization of Eastern Caribbean States

5. **The OECS was established by the "*Treaty of Basseterre*", which was signed in June 1981 by seven of the region's governments:** Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. Since then the British Virgin Islands and Anguilla have both been admitted to the OECS as associate members.[4]

6. **The overarching objective of the OECS is the creation of an economic union of OECS member states**. Pursuing the creation of an economic union was first agreed by the OECS Authority in July 2001.

7. **At the January–February 2002 meeting of the OECS Authority**, **the Heads of Government agreed on, among others, the following measures for member states**:

- Legislative arrangements to facilitate the free movement of OECS nationals should come into effect not later than March 12, 2002.

- The Immigration Acts be amended to allow OECS nationals to travel freely within the sub-region and remain in another territory for a period of six months.

- In Dominica, Grenada, St. Lucia, and St. Vincent and the Grenadines, the Alien Landholding Licenses would not apply to OECS nationals, but while the licenses remain in the other member states, measures would be contemplated to exempt OECS nationals from payment of the license fees.

- In addition to regular passports and travel permits, photo identification cards, including driver's licenses and national identification cards, will be accepted at ports of entry.

---

[3] IMF (2003), "Regional Integration and Trade Policy", in *Eastern Caribbean Currency Union: Selected Issues*, IMF Country Report 03/88, International Monetary Fund, Washington, DC.

[4] Thus, the OECS comprises the eight member countries and territories of the ECCU and the British Virgin Islands (BVI). The BVI and Anguilla were admitted in 1984 and 1995 respectively. Unlike a "full member", the rights and obligations of an "associate member" do not extend to all aspects of the Treaty, and these are specified when the member is admitted.

- A common passport for OECS nationals should be introduced by January 2003. Persons granted economic citizenship would not be issued an OECS passport.

8. **In October 2002, the OECS Authority reiterated its commitment to the creation of the OECS Economic Union** and agreed to appoint a committee that would review the "*Treaty of Basseterre*" and recommend how this could be aligned with the requirements of an economic union. The OECS Authority also established target dates for the free movement of goods and services (end-2003), free movement of labor (end-2007), and endorsed the Eastern Caribbean Central Bank's (ECCB's) program to develop the region's money and capital markets. The report on the implications for the "*Treaty of Basseterre*" of the proposed economic union of the sub-region was reviewed in January 2004, and an agreement was reached to draft a new Treaty, rather than amend the "*Treaty of Basseterre*".

9. **While progress has been made in implementing some measures, the countries of the OECS have not been able to meet the implementation schedule that was agreed upon in January 2002.** Most progress has been made in the area of facilitation of travel and freedom of movement in the sub-region. For instance, the travel facilitation initiative was legislated in 2002, allowing OECS nationals to travel freely within the area and remain in another territory for up to six months. On the matter of removal of work permit requirements, the governments of Antigua and Barbuda, Montserrat, and St. Vincent and the Grenadines have agreed, on the basis of reciprocity, to remove work permit requirements for: (i) self-employed professionals and their immediate family; and (ii) self-employed service providers, their technical and managerial staff, and immediate family. The governments of Grenada and St. Kitts and Nevis, while agreeing in principle, expressed the need to consult further with their respective cabinets. The remaining governments undertook to study the proposals and communicate their positions to the OECS Secretariat as early as possible. Regarding common citizenship, a draft of the Common Citizenship Act is already under review by member states and it is expected to be discussed at the May 2004 meeting of the OECS Authority, while negotiations are ongoing with companies that have expressed interest in producing OECS passports.

10. **Other areas of integration in which OECS countries have made progress are joint representation at world fora and provision of civil aviation services**. In the area of joint representation, the OECS is planning to set up a Technical Mission in Geneva in the first half of 2004 in order to facilitate a more effective representation of OECS interests in the World Trade Organization (WTO). Regarding civil aviation services, in January 2004 the governments gave their commitment to pass the new Civil Aviation Act in their national parliaments during the first quarter of 2004. The Act provides for the transformation of the current Directorate of Civil Aviation (DCA) to an autonomous Civil Aviation Authority. The approval of the new civil aviation regulations will allow OECS member states to effectively meet their international civil aviation obligations and, specifically, to be in compliance with those of the United States Federal Aviation Administration (FAA), which will expedite the process of the OECS returning to Category One status.

The Caribbean Community

11. **The CARICOM was established by the "*Treaty of Chaguaramas*" which was signed in Trinidad in July 1973** by Barbados, Jamaica, Guyana, and Trinidad and Tobago; these countries were joined shortly thereafter by eight other territories, principally from the Eastern Caribbean.[5]

12. **In the 1989 "Grand Anse Declaration", the Conference of Heads of Government (the highest decision-making body of CARICOM) decided to create a Caribbean Single Market and Economy (CSME).** This would integrate the CARICOM economies into a unified market with free movement of goods and services, capital and labor, and create a single economy that operates under the same coordinated and harmonized economic policies. The intention was that this would allow the region to exploit economies of scale from a large internal market and strengthen its international bargaining position in an effort to deal with globalization, but without establishing a political union. To implement the CSME, the "*Treaty of Chaguaramas*" was suitably modified by negotiating nine Protocols. [6]

13. **Two factors hindered the adoption of CSME.** *First*, the process has been characterized by slow progress in bringing national laws into line with the tenets of the Protocols. The risk that the CSME process may eventually lead to a process of political unification has been a source of concern for many countries. *Second*, a lack of awareness and, therefore, ownership by the public in the member countries.

14. **In an effort to accelerate the adoption of the CSME, a revised treaty was signed in February 2002** which incorporated all the previous Protocols, and whose ratification would bring into force the agreed components of the CSME. As of February 2004 seven members (Antigua and Barbuda, Grenada, Guyana, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago) have ratified the revised treaty, while five (Barbados, Belize, Dominica, Jamaica, and St. Kitts and Nevis) are yet to ratify it. The Bahamas and Montserrat have not yet signed the revised treaty.

15. **Free movement of labor and the establishment of the Caribbean Court of Justice (CCJ) are two areas in which CARICOM has made some progress.** Regarding the free movement of labor, most national countries have passed the necessary legislation to facilitate the movement of some work categories (university graduates, artists, media

---

[5] The current 15 members of CARICOM are: Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. Haiti is the newest member, as from July 2002. Anguilla, the British Virgin Islands (BVI), Cayman Islands, and Turks and Caicos are associate members.

[6] See IMF (2003), op. cit., for an overview of the initial work program of the "Grand Anse Declaration" and of the content of the Protocols.

workers, musicians, and sports persons). With respect to the CCJ, an important step forward was made in July of 2003 with the signature of four legal instruments related to the establishment and operation of the court. The inauguration date of the CCJ is scheduled for the third quarter of 2004.

16. **In spite of the progress that has been made, important challenges remain for the successful completion of the CCJ and labor mobility initiatives**. In the case of free movement of labor, there is the concern among the relatively richer countries that migration from poorer countries will be large. Regarding the CCJ, it is uncertain whether it will actually be the final court of appeal, since some countries may retain access to the Privy Council and others are planning to maintain their own appeal system.

C. Trade Regimes and Practices in the ECCU

Trade Regimes

17. **Trade liberalization is one of the key objectives of CARICOM to meet the goal of forming a single market in the region.** In 1973, a common external tariff (CET) was adopted that applied uniform tariffs to imports from outside the region. Starting in 1993, the countries agreed to a schedule of phased reductions in the CET; the objective was to lower the maximum CET from 45 percent to 20 percent on most types of goods by 1998. However, ECCU countries were allowed to adjust at a slower pace. Despite that, several of these countries have found it difficult to implement the final reduction, due to concerns about domestic production and a lack of alternative policies to replace lost revenues from lowered tariffs. As of end-2002, with the exception of Antigua and Barbuda and St. Kitts and Nevis, all the ECCU countries had implemented the fourth phase of the CET; that is, the maximum tariffs on most non-agricultural goods from non-CARICOM countries is 20 percent.

18. **A comparison of the restrictiveness of trade regimes is presented in Table VII. 1, with the ranks ranging from 1 (least restrictive) to 10 (most restrictive)**. The severity of both tariff and non-tariff barriers was assessed using the IMF's qualitative indexes of trade restrictiveness. For each country, the tariff regime is ranked from 1 to 5, one being the least restrictive. Additionally, nontariff barriers (NTB) are ranked from 1 to 3, where one is the least restrictive. The overall index of trade restrictiveness is obtained by combining the rankings for tariff and nontariff barriers. The ranking of tariffs in Table VII.1 are based on simple average of tariff rates.

19. **According to the overall index of restrictiveness, the trade regimes of the six ECCU members are moderately restrictive, ranging between 5 and 6.** In contrast to the ECCU countries, most of the other Caribbean countries have less restrictive trade regimes (the Dominican Republic, Jamaica, and Trinidad and Tobago). Notable exceptions are the Bahamas and Barbados, which have regimes similar to the ECCU countries. All Caribbean countries considered in the sample have trade regimes in the moderate range, with the Bahamas being the most restrictive and Jamaica and Trinidad and Tobago at the other extreme. When effective average tariff rates (which take into account customs and other

charges) are considered, the restrictiveness of the ECCU countries are highest (with the exception of Bahamas).

20. **For a number of ECCU countries, state monopolies import key products and nontariff barriers (such as quantitative restrictions) exist on some imports.** In contrast, non-ECCU countries generally have licensing systems. Further liberalization of trade regimes in ECCU countries has been partly constrained by a lack of trained personnel and high administration costs.

21. **Other charges on traded goods also confirm that that ECCU countries are typically more restrictive than other Caribbean countries.** As Table VII.1 indicates, ECCU countries impose a flat rate customs charge on imports (ranging from 4 percent to 10 percent) while two countries (St. Kitts and Nevis and St. Lucia) impose a consumption tax on imports. This is more restrictive than non-ECCU countries, where stamp taxes or surcharges on a small number of imports are generally imposed. The higher customs duties in ECCU countries reflects, in part, these countries' dependence on revenues from trade, and their lack of administrative capacity to implement other revenue measures to substitute for any lowered tariff revenues. In other non-ECCU Caribbean countries, a value-added tax and/or an income tax serve as alternate sources of revenue.

Fiscal Implications of the Trade Regime

22. **A comparison of average and imputed tariff rates reveals that the imputed rates are consistently lower than the average rates, but this difference has narrowed over time (Figure VII.1).**[7] Imputed tariffs are calculated as the ratio of collected import duties to total imports of merchandise goods. As Table VII.2 indicates, imputed tariff rates are lower than average tariff rates by a factor of 2, reflecting in part discretionary exemptions and low collection rates. While average tariff rates declined between 1995 and 2002 for all countries, the imputed rates increased during this period for three of the six ECCU countries (Antigua and Barbuda, Dominica and St. Vincent and the Grenadines), possibly indicating better collection rates and/or a decline in tariff exemptions. As of 2002, the differential between actual and imputed tariffs was smallest for St. Lucia (at 3.2 percent), and largest for Grenada (at 5.5 percent).

23. **Average tariff rates in all ECCU countries fell sharply in 1998, and (with the exception of Dominica) increased marginally thereafter**. The decline in ECCU tariff rates in 1998 is most likely a reflection of the implementation of the second phase of the CET. In Antigua and Barbuda actual tariff rates spiked in 2000, before returning to their pre-2000 level.

---

[7] This estimation method has its difficulties, in that it does not give due regard to the timing of imports and the uneven distribution of imports across the tariff lines. The composition of imports may also have changed over time.

24. **To estimate the fiscal impact of the difference between actual and imputed tariffs, the rates were weighted by the value of imports and expressed as a share of GDP.** These results, for ECCU countries, are given in the last panel of Table VII.2. On average, the annual amount of budget revenue forgone over the period 1995-2002 ranges from a high of 3.8 percent of GDP (Grenada) to a low of 1.5 percent of GDP (St. Kitts and Nevis and St. Lucia). As of 2002, forgone revenue to the budget was at least 2 percent of GDP in each of Grenada, St. Kitts and Nevis, and St. Vincent and the Grenadines.

25. **Other estimates of the fiscal revenue foregone due to exemptions granted on all taxes (customs duties and consumption taxes) point to larger losses than those suggested in Table VII.2.** Bain (1995) estimates the revenue foregone at the beginning of the 1990s to be: 4.1 percent of GDP in Dominica (1992–93), 13.5 percent of GDP in Grenada (1991), 5.5 percent of GDP in St. Lucia (1992), and 7.1 percent of GDP in St. Vincent and the Grenadines (1991).[8] More recently, an IMF technical assistance mission estimated that in 2001 the revenue foregone was around 5 percent of GDP in Dominica and around 6 percent of GDP in St. Vincent and the Grenadines. Preliminary estimates by the government of Grenada suggest that for 2003 the revenue foregone in that country was around 8.5 percent of GDP.

26. **The above results are important in the context of the current economic and fiscal environment faced by ECCU countries.** Many of these countries are having difficulties in raising sufficient revenues to balance their budgets, and have continuing problems associated with their high levels of external debt. Some part of these net revenue shortfalls could be addressed by reducing, if not eliminating, exemptions on import duties.

Composition of Exports from ECCU Countries

27. **Although agriculture remains an important sector of ECCU economies, there has been a gradual shift away from agriculture in ECCU countries, particularly from 1990 onwards** (Figure VII.2). In large part, the decline in agricultural exports is due to the high cost of production in ECCU countries compared with their competitors in South and Central America, and to the reduction in preferential access to markets in the European Union (see Appendix I). The decline of agriculture has been particularly marked in St. Lucia, with a sizeable reduction also occurring in Dominica—in both cases this decline has been driven by the steady shrinkage of banana export receipts (see Appendix II). Major exceptions have been Grenada and St. Vincent and the Grenadines. In Grenada, the almost total disappearance of banana exports has been offset by a dramatic increase in exports of nutmeg; in St. Vincent and the Grenadines, there has also been some success in diversifying agricultural exports into non-banana crops, particularly arrowroot.

[8] Bain, Laurel (1995), "Tax Concessions and their Impact on the Revenue Base of the ECCB Territories," unpublished manuscript, Eastern Caribbean Central Bank, Basseterre.

28. **The countries experiencing sharp declines in agricultural exports are largely dependent on banana exports and the preferential access to the European Union (EU) market.** The move to significantly alter these countries' access to the EU market has had a severe impact on their economies. In 1997, the EU found that employment in the banana industry was over 50 percent of the labor force in St. Vincent and the Grenadines, and about 30 percent of the labor force in Dominica and St. Lucia. The same study found that as the market for bananas (and thus domestic incomes) shrank, more and more small-scale farmers were withdrawing from farming and either moving to the cities or emigrating. Larger and wealthier farmers were taking over these small plots, which should lower costs of production. Indeed, it is estimated that the number of active banana growers in the Windward Islands (Dominica, St. Lucia, St. Vincent and the Grenadines and Grenada) has declined from 24,000 in 1993 to about 7,000 in 2001.[9]

29. **While the share of merchandise exports in economic activity has not been rising during the 1990s for most ECCU countries, the contribution of tourism receipts remains important.** As ECCU countries run large balance of trade deficits on merchandise goods, net receipts from tourism operate to partially offset trade imbalances in the current account (Figure VII.2). Nonetheless, the economic importance of tourism varies across ECCU countries, with tourism receipts (as a share of GDP) ranging from about 40 percent (Antigua and Barbuda and St. Lucia) to about 20 percent (all other ECCU countries).

Trade Integration and the ECCU

30. **The increased integration obtained through the Caribbean common market and the CET has not resulted in significantly more trade among ECCU countries (Table VII.3).** For most ECCU countries, intra-ECCU trade (export and import) flows (as a share of GDP) in the period 1998-2002 have not increased vis-à-vis the 1995–97 average—indeed, in four of the six ECCU countries (Dominica, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines) they have declined (Figure VII.3). This largely reflects the ECCU countries' declining overall trade-to-GDP ratio, which has accompanied the shrinkage of their traditional agricultural exports. In general, trade with other Caribbean countries has increased from 1995–97 to 1998–2002, but in large part this is attributable to imports of petroleum and petroleum products from Trinidad and Tobago. However, when measured as a share of total (export and import) trade flows, average intra-ECCU trade has increased slightly across the two sub-periods, with intra-ECCU exports rising from about 12 to 15 percent of total ECCU exports between 1995 and 2002 (Figure VII.4). As to specific countries, the Windward Islands of Dominica, Grenada and (in particular) St. Vincent and the Grenadines stand out as depending to a much greater extent than other ECCU countries on

[9] See IMF (2002), "The Restructuring of the Banana Industry in St. Lucia and the Windward Islands," in *St. Lucia—Selected Issues and Statistical Appendix*, IMF Country Report 02/14, International Monetary Fund, Washington DC.

intra-ECCU trade, with St. Vincent and the Grenadines having about one-third of its total trade with other ECCU countries.

Caribbean Preferential Trade Arrangements: Bananas and Sugar

The Windward Islands (Dominica, Grenada, St. Lucia, and St. Vincent and the Grenadines) have a preferential trade arrangement in bananas with the European Union (EU), while St. Kitts and Nevis, together with other major Caribbean countries, have a preferential arrangement with the EU in sugar.

The EU Banana Regime

Prior to the establishment of a Single European Market (EU) in 1993, several national arrangements regarding imports of bananas existed. France and the United Kingdom imported duty-free from their ex-colonies and overseas departments in the Caribbean, Africa and the Pacific ("ACP" bananas); Spain and Greece produced sufficient quantities for own consumption in the Canary Islands and Crete; Portugal and Italy imported a minor share of total bananas from Madeira, the Azores and Somalia while the largest share came from Latin America ("dollar" bananas) at a tariff of 20 percent; all banana imports of Denmark and the Benelux countries had a 20 percent tariff; and Germany imported dollar bananas duty free. The unified EU banana regime operated from 1993–98 with the following features:

- The annual ACP banana quota allowed the twelve traditional producers to export, duty-free, up to a maximum of 857,500 tons; volumes were allocated to each country via licenses.

- The annual quota for dollar bananas was initially set at 2 million tons with a tariff of ECU 100 per ton; in 1994 following negotiations with Costa Rica, Colombia, Nicaragua, and Venezuela, this quota was raised to 2.1 million tons (further to 2.2 million tons later) and the tariff reduced to ECU 75 per ton. These four countries were allocated almost half of total import licenses.

- EU banana producers were entitled to subsidies or compensation payments when the price fell below a certain threshold. This, together with the quantity restrictions, contributed to the price of bananas in the EU being about 80 percent higher than the world price.

- In 1995, an increase of 353,000 tons was added to the dollar quota, equivalent to the consumption of three new members—Austria, Finland and Sweden.

From its beginning, the EU banana regime was controversial and several legal challenges were presented to the GATT. In 1995, four Latin American banana exporters (Honduras, Guatemala, Ecuador, and Mexico) and the United States lodged a complaint with the World Trade Organization (WTO), arguing that they were restricted in their access to the EU market. In 1997, the WTO Dispute Settlement Panel (DSP) found that the EU could keep its preferential agreements with the ACP countries, but needed to reform some aspects such as the licensing system. The EU appealed this decision and lost in 1998, which meant that the reforms needed to be implemented as of January 1, 1999.

The key elements of the reformed system were: (i) an overall tariff-quota of 2.2 million tons annually at the duty of ECU 75 per ton for third country bananas and duty free for non-traditional ACP producers; (ii) the allocation of nearly 90 percent of the dollar banana quota to the main suppliers (Ecuador, Costa Rica, Colombia and Panama); (iii) elimination of export certificates and a simplified import license system; (iv) elimination of national allocations—each ACP country could export as much as desired up to the combined limit of 857,700 tons; and (v) a revision of the calculated EU production costs and an increase in the threshold for triggering compensation payments.

However, Ecuador filed another complaint with the WTO, and in April 1999 the WTO found that the while the reformed regime discriminated against U.S. marketing companies and Latin American producers, the EU could still grant preferential status to ACP countries under the Lomé Convention, for which a WTO waiver had been granted.

In order to settle the remaining controversy over the banana regime, in April 2001 the EU approved reforms to the system to come into force as of July 1, 2001. These reforms included: (i) the elimination of national allocations of the dollar quota; (ii) the transfer of 17 percent of the dollar quota to nontraditional operators (those not trading during the reference period); (iii) the transfer, as of January 1, 2002, of 100,000 tons from the ACP to the dollar quota; and (iv) the replacement of this regime by a tariff-only regime (no quotas or licenses) for dollar bananas as of January 1, 2006.

The introduction of a tariff-only regime in 2006 will remove the restrictions on the volumes of bananas imported into the EU, but allows the tariff preference for ACP bananas to remain until 2008. The fundamental issue outstanding is what level will be set for the EU tariff on dollar bananas? If the tariff is set too low, it is likely that the Windward Island countries would be squeezed out of the market as total imports rise and prices paid to importers fall. In addition, ten new countries will accede to the EU in 2004, and as a consequence the EU banana market will rise from 4 million to 4.5 million tons. Within the context of the Common Agricultural Policy (CAP), there is concern that the entry of these countries may make the EU banana arrangement unsustainable. It is through the CAP that payments are made to producers when prices fall, and the new EU member countries have no historic ties with ACP countries.

The EU Sugar Regime

Many sugar-producing countries in the Caribbean are experiencing difficulties arising from reduced preferential access to EU markets, as well as the prospect of deregulation of the EU sugar market by 2007. Since 1975, under the terms of the Lomé Convention, the ACP countries have been able to provide certain quantities of raw sugar to the EU at guaranteed prices. The Sugar Protocol (SP) currently provides for EU imports of 1.29 million tons of ACP-produced sugar. If there were to be a shortfall in the supply of sugar to EU refiners, the Special Preferential Sugar (SPS) Agreement allows for extra allocations of sugar from the ACP countries to be imported duty-free, or at a reduced tariff. In the period

September 2001–August 2002, the EU imported just over 1.5 million tons of sugar under these terms.

The price that EU currently pays ACP sugar producers is about twice the international price of sugar. Other sugar producers, such as Australia and Brazil, have filed a complaint with the WTO concerning this arrangement in February 2003. At issue is not the preferential treatment given to ACP countries, but rather the subsidies given to these countries. The EU imports raw sugar from the ACP countries at above-market prices, then refines the sugar and re-exports it at below-market price, which according to the other sugar producers results in unfair competition. The current arguments are reminiscent of the banana dispute.

Notwithstanding the decline in the Caribbean sugar industry over the last century, the industry remains an important source of foreign exchange and employment in six Caribbean countries (St. Kitts and Nevis, Barbados, Belize, Guyana, Jamaica, and Trinidad and Tobago). Under the SP, these countries export annually about one-third of the ACP total. In 2002, sugar production costs for the largest Caribbean producer, Guyana, were about US$0.20 per pound; for the second largest producer, Jamaica, about $0.32 per pound, while the international cost was about $0.11 per pound. At this time, the EU paid Caribbean producers $0.20 per pound.

This preferential scheme is being dismantled and by 2007, Caribbean sugar industries will have to compete in the international market. These countries experienced a free-market arrangement in 2001 when the EU started its program of Everything But Arms (EBA) as a start to removing its tariffs for LDCs. While sugar was classified as a sensitive good—with tariffs being reduced gradually—in 2001–02 the EU reallocated some 75,000 tons of sugar away from the ACP producers to some of the other LDCs. For the largest Caribbean producers (Belize, Guyana, Jamaica, Trinidad and Tobago), their SPS allocations were reduced by up to half. Some of these countries have started preparing for the consequences of total deregulation, but the down-sizing of the industry will result in large losses in employment, which has already resulted in labor actions in some countries.

The Evolution of Banana and Sugar Prices[1]

Sugar is an internationally-traded commodity with a "world" price reflecting current demand and supply conditions. Nevertheless, the proceeds that specific producers receive from the sale of sugar can be vastly different because of the existence of domestic subsidies for production. This is particularly the case for sugar producers selling their product in the United States and European Union. Appendix Figure VII.1 shows the historical price of sugar since January 1990, together with an estimate of the long-run trend (see smooth line).[2] The figure clearly reveals the large subsidies available to producers of sugar sold in the United States and European Union markets. It also suggests a downward trend in the world price of sugar that is particularly acute since July 2001. The average real price of sugar was nearly 11.5 cents per pound during the 1990–1999 period, but has since fallen to less than 9 cents per pound. This downward trend in prices is expected to continue in 2003/04 and 2004/05, but at a slower pace, until world demand—estimated to be 138 million tonnes in the 2003/04 season relative to a demand of 135 million tonnes—catches up with supply by 2005/06. However, steady growth in the supply of sugar, particularly from Brazil, China and Thailand, will continue to place considerable downward pressure on world prices in the near term. Appendix Table VII.1 shows the IMF's baseline forecasts for nominal and real (shown in parentheses) sugar prices for 2004–08.

Appendix Table VII.1. IMF Sugar Price Baselines (Annual Averages)

Date	Forecasted Price (U.S. cents per pound)		
	World	USA	European Union
2004	6.9 (7.3)	22 (23.4)	26.9 (28.6)
2005	6.8 (7.1)	22.3 (23.4)	26.9 (28.3)
2006	7.2 (7.5)	22.6 (23.6)	26.9 (28.1)
2007	7.6 (7.8)	22.8 (23.5)	26.9 (27.8)
2008	8 (8.2)	22.9 (23.4)	26.9 (27.5)
Average	**7.3 (7.6)**	**22.51 (23.5)**	**26.9 (28.1)**

Bananas are an internationally-traded commodity with supply dominated by low-cost producers in Latin America and the Philippines. Banana prices are quite volatile, reflecting seasonal imbalances between production and demand. Appendix Figure VII.2 shows the historical price of bananas since January 1990 and an estimate of the long-run

[1] Prepared by the Commodities Unit of the IMF's Research Department.

[2] Sugar prices are expressed in U.S. cents per pound. Nominal prices were deflated by the Fund's manufacturer's unit export value index (1995=100).

trend in prices (smoothed line).[3] There has been a long-term decline in the real price of bananas that has become quite pronounced since July 2002. The average long-run real price of bananas was US$524 per metric tonne during the decade 1990–1999, but has fallen to average only US$464 per metric tonne since July 2002, well below the average cost of production for many producers. Significant increases in output (and exports) by Brazil and the Philippines appear to be the main factors behind the decline.[4] Banana prices are expected to recover slightly in 2004, and move up thereafter, reflecting the impact of steady growth in demand and a possible constraint on supply due to the threat of the Black Sigatoka disease (see Appendix Table VII.2).

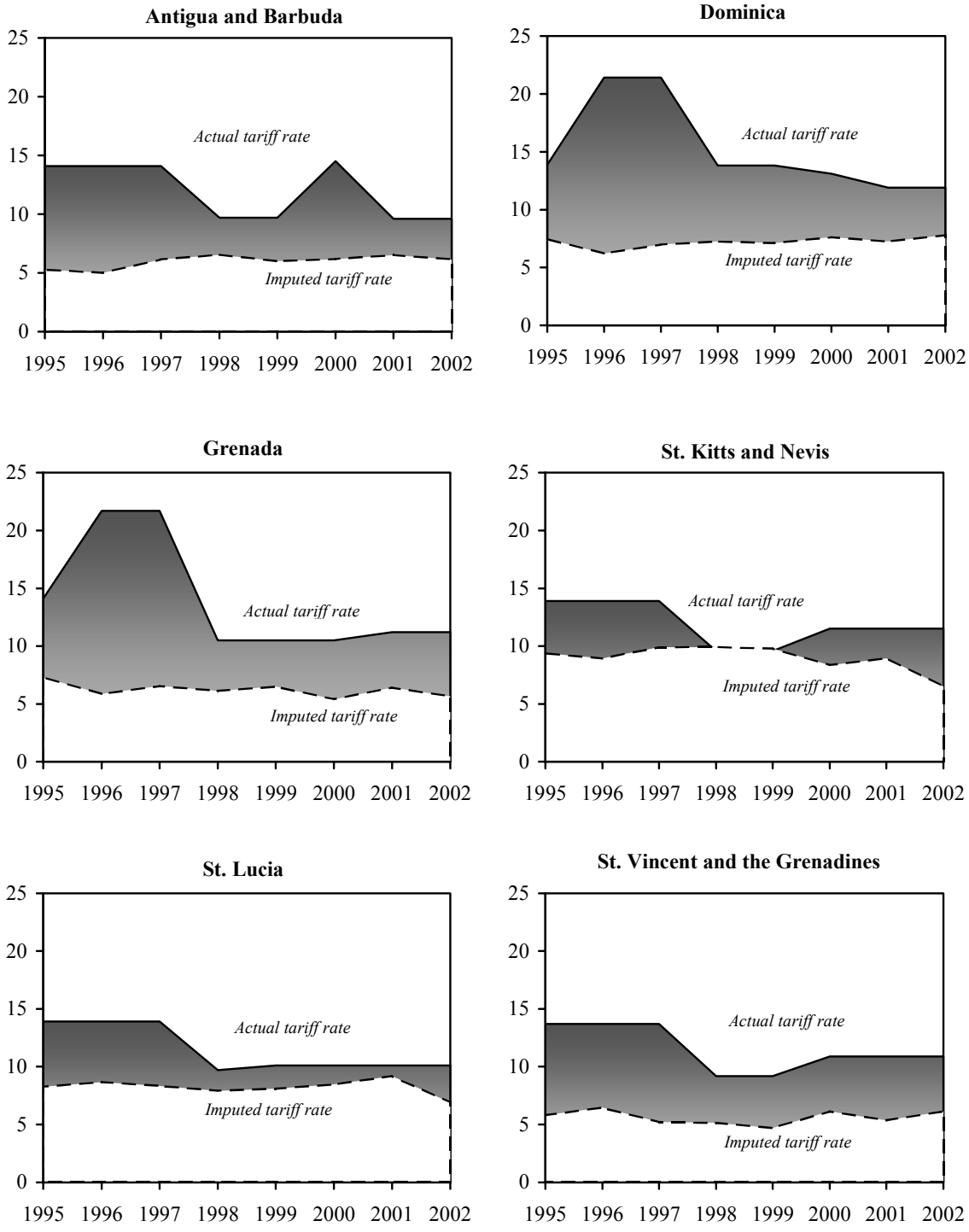
Appendix Table VII.2. IMF Banana Price Baselines (Annual Average)

Date	Forecasted Price (U.S. dollars per metric tonne)
2004	400 (426)
2005	440 (464)
2006	460 (480)
2007	480 (496)
2008	500 (511)
Average	**456 (476)**

[3] Banana prices are expressed in U.S. dollars per metric tonne. Nominal prices were deflated by the Fund's manufacturer's unit export value index (1995=100).

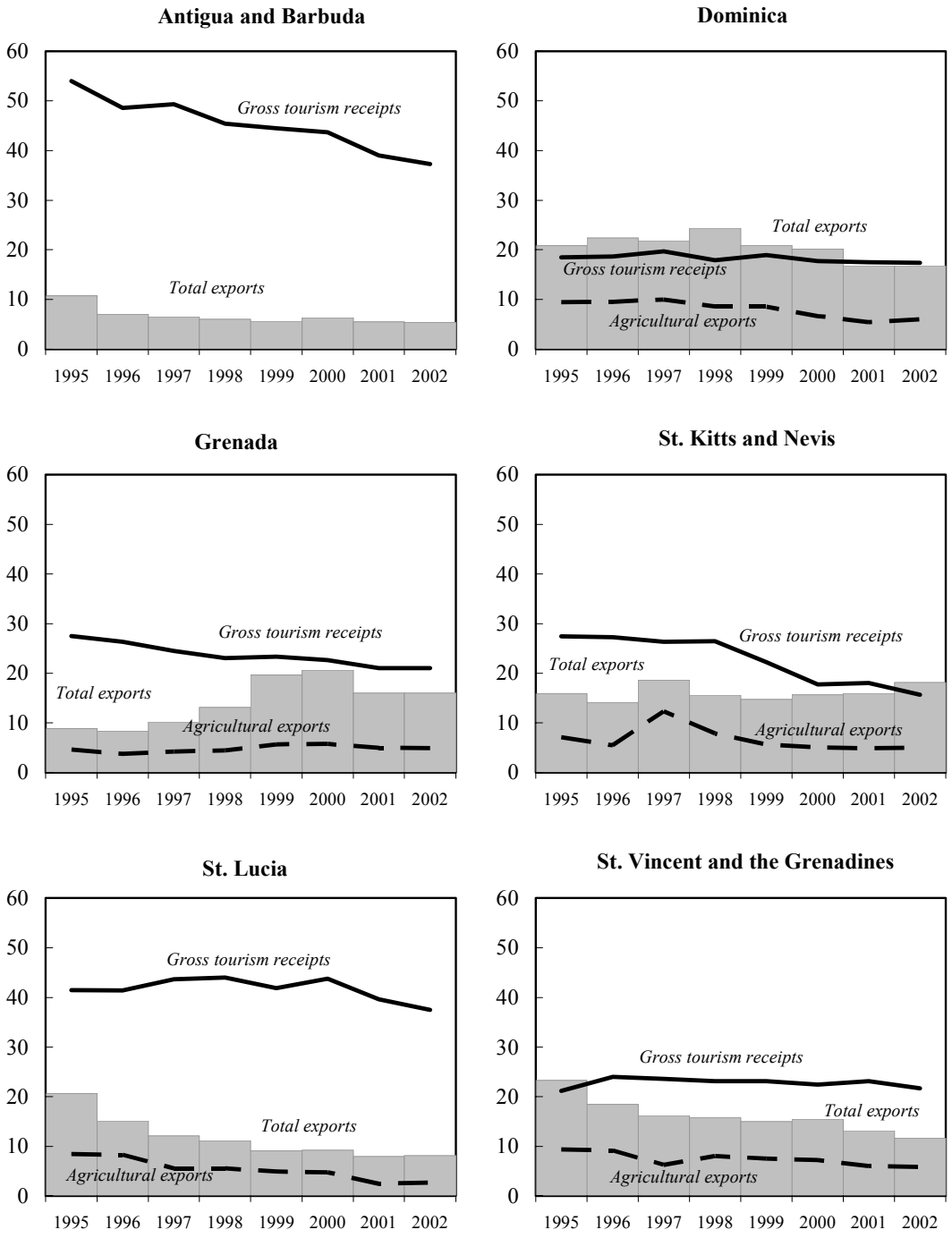
[4] Brazil exported 126,000 tonnes in the first half of 2003, which is more than its exports for the whole of 2001.

Figure VII.1. ECCU: Actual Tariff Rate and Imputed Tariff Rate, 1995–2002
(In percent)



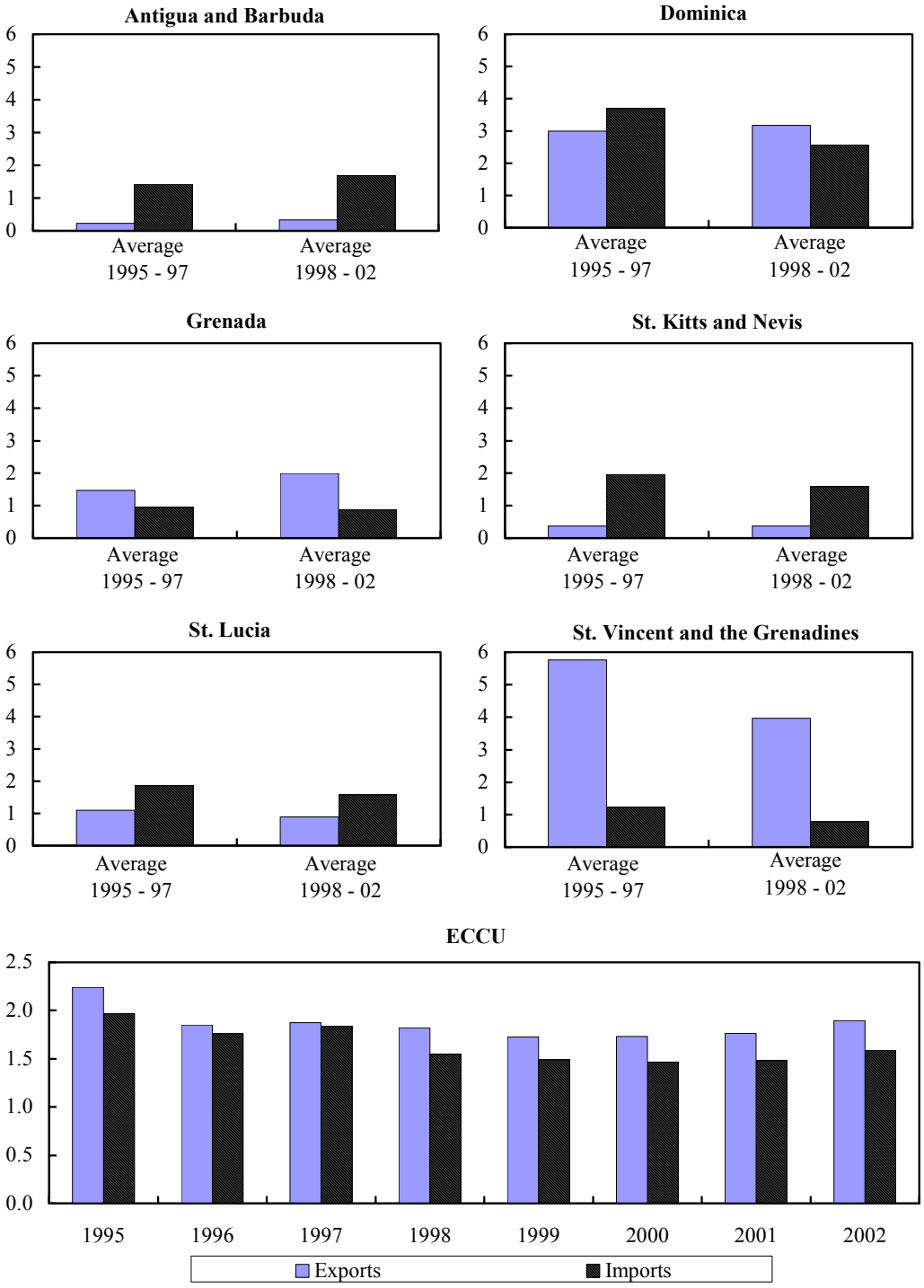
Sources: ECCU country authorities; IMF Trade Restrictiveness Database; and Fund staff estimates.

Figure VII.2. ECCU: Exports of Goods and Tourism Receipts, 1995–2002
(In percent of GDP)



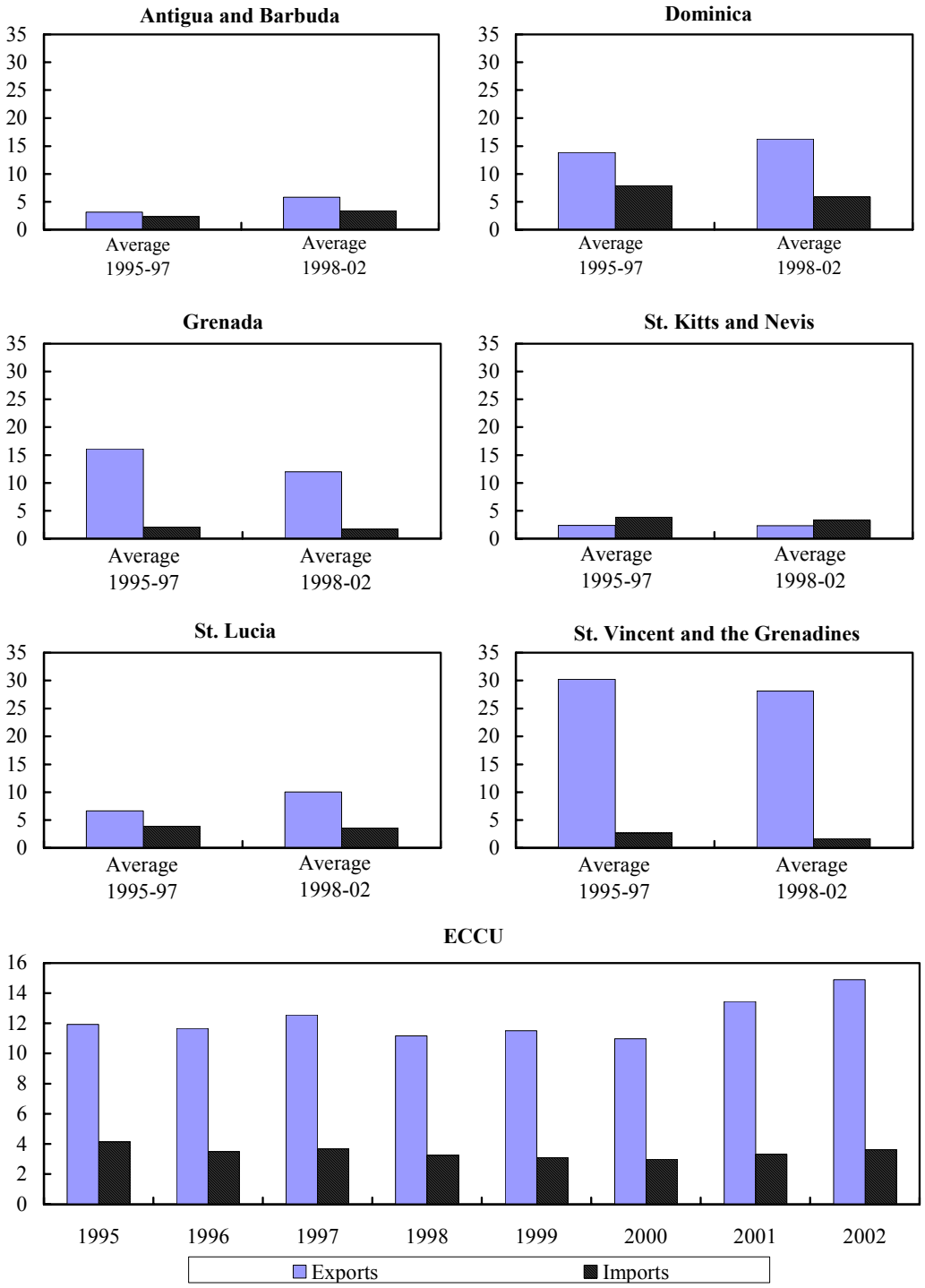
Sources: IMF Direction of Trade Statistics; IMF Balance of Payments Statistics; Fund staff estimates.

Figure VII.3. Intra-ECCU Trade Flows as a Share of GDP
(In percent)



Sources: ECCU country authorities; and Fund staff estimates.

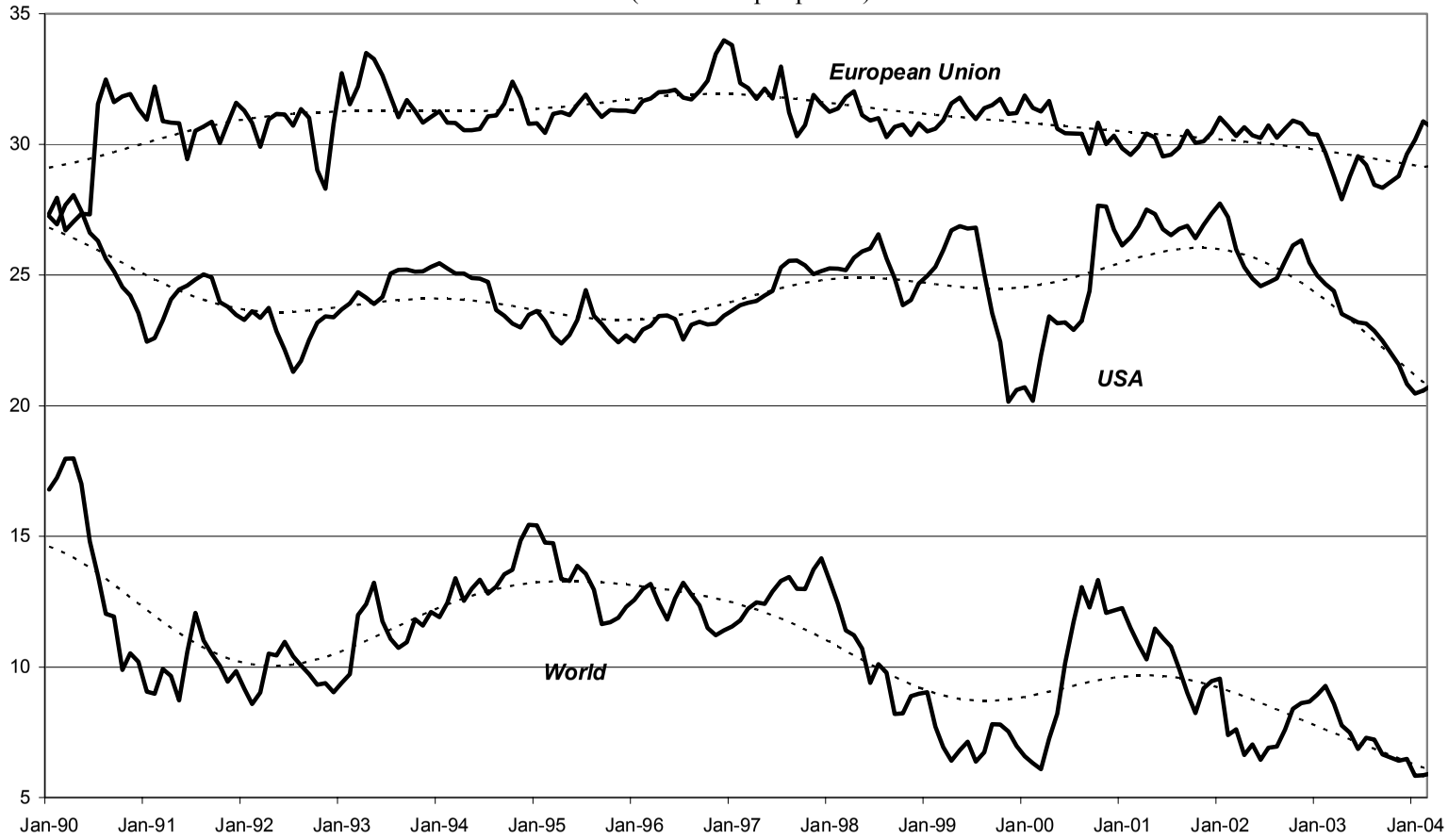
Figure VII.4. Intra-ECCU Trade Flows as a Share of Total Trade Flows
(In percent)



Sources: ECCU country authorities; and Fund staff estimates.

Appendix Figure VII.1. Real Sugar Prices, January 1990–February 2004

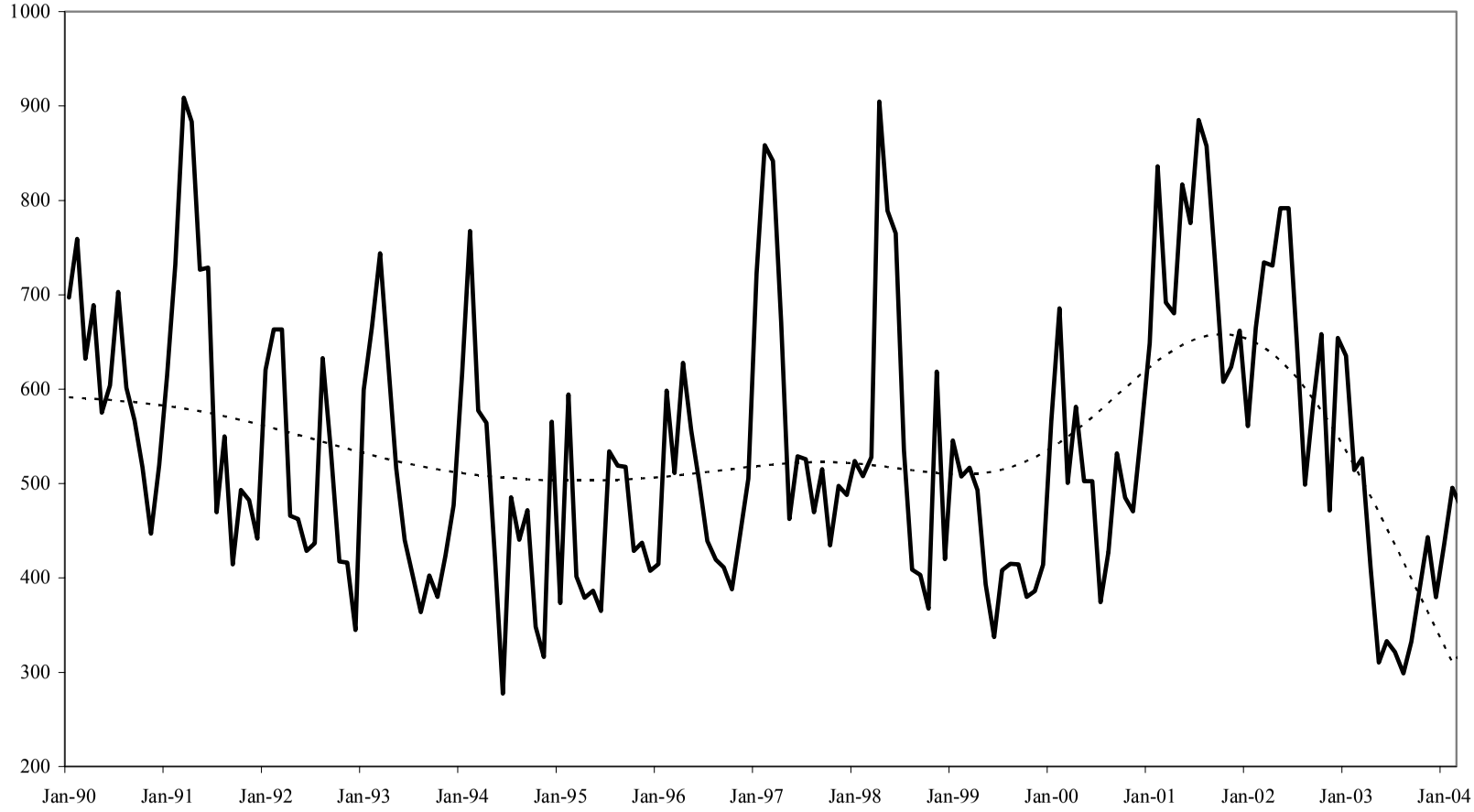
(U.S. cents per pound)



Source: International Monetary Fund, Commodity Price System.

Notes: Sugar (USA) is the U.S. import price, CSCE nearest futures, c.i.f. New York; sugar (EU) is the European Union negotiated import price for raw unpackaged sugar from ACP countries, c.i.f. European ports; sugar (world) is the free market price, CSCE nearest futures, c.i.f. New York. Dashed lines are measures of the long-run trend (smoothed versions) of the respective real price series. All nominal price series were deflated using the Fund's manufacturers' unit export value index.

Appendix Figure VII.2. Real Banana Price, January 1990–February 2004
(U.S. dollars per metric tonne)



Source: International Monetary Fund, Commodity Price System.

Notes: Banana (Central American and Ecuador) is the U.S. importer's price, f.o.b. U.S. ports, U.S. dollars per metric tonne (Chiquita, Dole and Del Monte). The dashed line measures the long-run trend (smoothed version) of the real price series. The nominal price series was deflated by the Fund's manufacturers' export unit value index.

Table VII.1. Description of the Trade Regimes in the ECCU and Major Competitor Countries

Country (Latest Year)	Restrictiveness Rating			Tariffs 4/				CET Status	Nontariff Barriers	Other Charges
	Overall 1/	NTB 2/	Tariff 3/	Max.	Min.	Simple Average	Effective Average 5/			
Antigua & Barbuda (2003)	6	2	3	70	0	9.6	19.6	3rd phase	State monopoly in 5 key products; licensing requirements	10% customs fee (2002)
Dominica (2001)	5	2	2	165	5	11.9	14.9	4th phase	State monopoly on imports of rice, sugar;price controls on cement and fuel.	3% customs fee (2003)
Grenada (2001)	6	2	3	40	0	11.2	16.2	4th phase	State trading in milk,sugar, rice; some imports of agricultural products restricted.	5% customs fee (2001)
St. Kitts and Nevis (2003)	6	2	3	70	0	11.5	17.5	3rd phase	QRs for 4 products; licensing for eggs and other ag. products; state trading in sugar.	6% custom service fee (2003); 22.5% consumption tax on imports (2003)
St. Lucia (2002)	5	2	2	95	2.2	10.1	14.1	4th phase	Licensing for large number of agricultural and construction materials.	4% customs fee (2003); 0-35% consumption tax of imports (2003)
St. Vincent and the Grenadines (2001)	5	2	2	40	0	10.9	14.9	4th phase	Licensing for a large number of goods; QRs on number of goods including magarine, beef,chairs.	4% customs fee (2002)
Barbados (2001)	6	2	3	243	0	12.4	12.4	4th phase	Import licenses for some food products; government monopoly for poultry imports.	1% enrironmental levy on some products (2001)
Bahamas (2002)	5	1	5	260	0	30.7	34.0	na	None.	0–20% stamp tax on various imports (2002)
Dominican Republic (2003)	5	2	2	40	0	8.6	10.6	na	Moderate import licensing; some state trading.	2% import surcharge (2003);5-75% consumption tax on non-essential imports (2002)
Jamaica (2003)	5	2	1	75	0	8.9	8.9	4th phase	Licensing for certain imports; state trading in cocoa and coconuts.	18–85% stamp duties on some goods (2002)
Mexico (2001)	6	2	3	260	0	16.5	17.3	na	Restrictive licensing covering 6.7% of imports; ban on used cars.	0.8 % customs processing fee (2002)
Trinidad & Tobago (2002)	4	2	1	70	0	7.9	7.9	4th phase	Negative list QRs for 6 products; state trading in some products.	5–100% import surcharges on agricultural products (2002)

Source: International Monetary Fund's Trade Restrictiveness Database.

1/ On a scale of 1(low) to 10 (high).
2/ Nontariff barriers (customs and other charges); measured on a scale of 1 (low) to 3 (high).
3/ On a scale of 1 (low) to 5 (high).
4/ The simple average is the unweighted average of the actual tariff rates.
5/ The effective rate is the sum of the average tariff, customs and other charges.

Table VII.2. ECCU: Actual and Imputed Tariff Rates, 1995–2002

	1995	1996	1997	1998	1999	2000	2001	2002
				(In percent)				
				Imputed Tariff Rate 1/				
Antigua and Barbuda	5.3	5.0	6.2	6.6	6.0	6.2	6.5	6.2
Dominica	7.5	6.2	7.0	7.3	7.1	7.6	7.3	7.8
Grenada	7.3	5.9	6.6	6.1	6.5	5.4	6.4	5.7
St. Kitts and Nevis	9.4	8.9	9.9	9.9	9.8	8.3	9.0	6.5
St. Lucia	8.3	8.7	8.3	7.9	8.1	8.5	9.2	6.9
St. Vincent and the Grenadines	5.8	6.5	5.2	5.1	4.7	6.1	5.4	6.1
				Actual Tariff Rate 2/				
Antigua and Barbuda	14.1	14.1	14.1	9.7	9.7	14.5	9.6	9.6
Dominica	13.9	21.4	21.4	13.8	13.8	13.1	11.9	11.9
Grenada	14.1	21.7	21.7	10.5	10.5	10.5	11.2	11.2
St. Kitts and Nevis	13.9	13.9	13.9	9.6	9.6	11.5	11.5	11.5
St. Lucia	13.9	13.9	13.9	9.7	10.1	10.1	10.1	10.1
St. Vincent and the Grenadines	13.7	13.7	13.7	9.2	9.2	10.9	10.9	10.9
				Actual Less Imputed Rates				
Antigua and Barbuda	8.8	9.1	7.9	3.1	3.7	8.3	3.1	3.4
Dominica	6.4	15.2	14.4	6.5	6.7	5.5	4.6	4.1
Grenada	6.8	15.8	15.1	4.4	4.0	5.1	4.8	5.5
St. Kitts and Nevis	4.5	5.0	4.0	-0.3	-0.2	3.2	2.5	5.0
St. Lucia	5.6	5.2	5.6	1.8	2.0	1.6	0.9	3.2
St. Vincent and the Grenadines	7.9	7.2	8.5	4.1	4.5	4.8	5.5	4.8
				(In percent of GDP)				
				Revenues Forgone 3/				
Antigua and Barbuda	5.9	5.7	4.5	1.6	2.0	4.3	1.4	1.6
Dominica	2.9	7.5	7.0	2.9	3.1	2.6	2.0	1.6
Grenada	2.8	7.8	7.3	2.3	2.0	2.8	2.4	2.9
St. Kitts and Nevis	2.3	2.7	1.9	-0.1	-0.1	1.7	1.2	2.5
St. Lucia	2.7	2.4	2.8	0.8	0.9	0.8	0.4	1.3
St. Vincent and the Grenadines	3.6	3.3	4.4	2.2	2.4	2.1	2.5	2.0

Sources: IMF's Trade Restrictiveness Database; IMF Direction of Trade Statistics; and Fund staff estimates.

1/ Imputed tariff rate, calculated as the ratio of import duties collected to imports of merchandise goods.
2/ Simple (unweighted) average.
3/ Calculated as the differential between actual and imputed tariff rates, multiplied by the value of imports.

Table VII.3. ECCU: Trade Flows as a Share of GDP

(In percent of GDP)

	Average 1995–1997		Average 1998–2002		1998		1999		2000		2001		2002	
	Exports To	Imports From	Exports To	Imports From	Exports To	Imports From	Exports To	Imports From	Exports To	Imports From	Exports To	Imports From	Exports To	Imports From
Antigua and Barbuda														
Total (goods)	8.1	62.1	5.8	50.0	6.0	51.7	5.6	54.1	6.4	51.5	5.5	46.0	5.4	46.6
Of which														
ECCU	0.2	1.4	0.3	1.7	0.2	1.4	0.4	1.7	0.4	1.7	0.3	1.7	0.4	1.8
Other Caribbean	0.1	6.1	0.0	4.4	0.1	5.6	0.0	4.3	0.0	4.0	0.0	4.0	0.0	4.0
Rest of world	7.8	54.6	5.4	43.9	5.8	44.8	5.2	48.1	6.0	45.7	5.2	40.3	5.0	40.8
Tourism receipts (gross)	50.6		42.0		45.4		44.5		43.7		39.0		37.3	
Dominica														
Total (goods)	21.7	47.6	19.8	44.4	24.4	44.9	20.9	46.1	20.2	48.0	16.8	43.5	16.8	39.4
Of which														
ECCU	3.0	3.7	3.2	2.6	3.6	2.4	3.0	2.7	3.1	2.8	2.9	2.4	3.3	2.7
Other Caribbean	5.6	9.7	6.7	10.7	8.8	9.5	7.3	9.7	6.7	11.2	5.6	10.8	5.4	12.1
Rest of world	13.1	34.2	9.9	31.1	12.0	33.0	10.7	33.7	10.4	34.0	8.3	30.4	8.2	24.7
Tourism receipts (gross)	19.0		17.9		18.7		17.9		17.8		17.5		17.4	
Grenada														
Total (goods)	9.2	46.3	17.1	51.3	13.1	52.1	19.7	48.7	20.7	53.9	16.0	49.5	16.0	52.1
Of which														
ECCU	1.5	0.9	2.0	0.9	1.7	0.9	1.7	0.8	2.0	0.8	2.2	0.9	2.4	1.0
Other Caribbean	0.8	12.3	1.0	14.6	1.2	14.8	1.1	13.5	0.8	13.3	0.9	15.4	0.9	16.1
Rest of world	6.9	33.1	14.1	35.8	10.2	36.4	16.9	34.4	17.8	39.8	12.9	33.3	12.7	35.0
Tourism receipts (gross)	26.1		22.2		23.1		23.3		22.7		21.1		21.0	
St. Kitts and Nevis														
Total (goods)	16.2	50.7	16.0	48.2	15.6	45.7	14.8	44.4	15.6	52.5	16.0	48.4	18.1	49.9
Of which														
ECCU	0.4	2.0	0.4	1.6	0.4	1.7	0.2	1.5	0.4	1.4	0.4	1.6	0.4	1.7
Other Caribbean	0.2	11.2	0.1	8.4	0.0	8.1	0.0	7.6	0.3	9.7	0.1	9.1	0.1	7.6
Rest of world	15.6	37.5	15.5	38.2	15.2	35.9	14.5	35.3	14.9	41.4	15.4	37.7	17.6	40.6
Tourism receipts (gross)	27.0		20.0		26.5		22.3		17.8		18.0		15.6	
St. Lucia														
Total (goods)	12.0	36.4	9.1	44.1	11.2	46.7	9.2	46.9	9.3	45.9	8.0	39.8	8.2	41.2
Of which														
ECCU	0.8	1.4	0.9	1.6	0.8	1.9	0.8	1.4	0.8	1.3	1.0	1.6	1.1	1.6
Other Caribbean	0.9	11.4	1.0	10.1	1.0	9.0	1.0	9.4	0.9	9.6	1.1	11.2	0.9	11.4
Rest of world	6.2	28.2	7.3	32.4	9.3	35.8	7.4	36.1	7.6	35.1	5.9	27.0	6.2	28.2
Tourism receipts (gross)	42.2		41.3		44.0		41.9		43.7		39.6		37.5	
St. Vincent and the Grenadines														
Total (goods)	19.3	47.6	14.2	47.5	15.8	53.7	15.0	53.6	15.4	43.0	13.2	44.9	11.7	42.2
Of which														
ECCU	5.8	1.2	4.0	0.8	4.3	0.9	4.2	0.9	3.7	0.7	3.7	0.7	3.9	0.7
Other Caribbean	4.4	10.8	3.2	13.2	3.2	13.2	3.3	12.4	3.1	12.7	3.8	14.1	2.7	13.7
Rest of world	9.1	35.5	7.1	33.5	8.3	39.5	7.5	40.3	8.6	29.6	5.7	30.1	5.2	27.8
Tourism receipts (gross)	22.9		22.7		23.1		23.1		22.5		23.1		21.7	

Source: International Monetary Fund, Direction of Trade Statistics.