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Determinants of Aggregate Export Performance of Caribbean Countries: A Comparative Analysis of Barbados, Costa Rica, Dominican Republic, Jamaica and Trinidad and Tobago

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INTER-AMERICAN DEVELOPMENT BANK
January 1995. Working Paper Series 201

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Working Paper Series 201
Washington, D.C.

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The objective of the working paper series is to present the results and conclusions of studies carried out by the Inter-American Development Bank, the Department of Integration and Regional Programs, the Latin American Network of Applied Research Centers, and visiting researchers (fellows), in order to promote the exchange of ideas and opinions on topics relating to economic and social development. Additionally, the purpose of the series is to get the findings out as soon as possible, even though the presentation may be less than perfect.

EXECUTIVE SUMMARY

This paper presents the results of a comparative analysis of aggregate export performance of a sample of five Caribbean-Basin countries, consisting of Barbados, Costa Rica, Dominican Republic, Jamaica, Trinidad & Tobago. The objective is to develop a sound empirical basis of understanding of the actual features of export performance and the factors determining success and failure, in the specific context of a representative sample of the small economies in this region. On this basis, it is hoped to contribute to the ongoing policy dialogue about measures aimed at influencing export performance in these and other comparable countries in the region and elsewhere.

The analysis deals with aggregate exports of goods and non-factor services and covers the twenty-five year period 1965-90. An analytical framework is developed which isolates a set of factors that may be considered to explain export performance. A key variable examined is the real exchange rate, which is suggested by both standard economic theory and evidence from other countries, and is considered a major factor in contemporary policy discussions. It is supplemented by a wide range of other explanatory variables related to structural and behavioral features of the economies and their initial conditions in the 1960s. Econometric methods are used for analysis with pooled cross-section and time-series data. The methodological approach developed here, as well as the substantive findings, may have considerable relevance to other countries and regions.

The results are of much interest, from the standpoint of both analysis and policy. The main findings are as follows.

A significant positive role is found for the real exchange rate. Specifically, a six-percent real depreciation adds one percent to the growth-rate of exports. This confirms the general hypothesis, supported by studies of other developing economies, that the exchange rate is a crucial instrument for creating incentives to production for export and, hence, for promotion of export growth. In this respect, the experience of the Caribbean countries is very much in line with that of other comparable countries. Moreover, for

this reason at least, among others, they cannot be considered a special case or somehow unique because of their "small size".

This generalization holds insofar as actual economic policy pursued in the Caribbean countries and their institutional structure (capital and labor markets) have allowed the exchange-rate mechanism to work. However, this condition has not generally nor always existed. Strong evidence is found here to support the hypothesis that operation of the exchange-rate mechanism in these countries is subject to a great deal of inertia, such that changes in the real exchange rate represent incomplete adjustment to changes in the underlying fundamentals. At the same time, there appears to be a significant long-term tendency to deterioriation in the export competitiveness of these countries. This tendency is one of the important factors which explains their relatively weak export performance as compared with other countries and regions, including the countries of East Asia.

External factors, such as export prices, terms of trade shocks, and external demand, have not been altogether adverse. In fact, from a close analysis of the available data, it appears that some of these factors have been quite favorable. And, even if adverse, as in the case of the terms of trade for some periods and for some countries, they do not appear to have created a significant handicap for export growth. Rather, it appears that the inhibiting factors in export growth are linked to internal or supply-side factors that need to be further examined. The key issue to be faced here is one of the anti-export bias of the existing structure of economic incentives.

Foreign resource inflows into these countries have been sustained at fairly high levels throughout the period, in the multiple forms of direct investment, loans, and transfers (public and private). There is an important question as to what is the net marginal effect of such inflows on export growth and which of various competing hypotheses may be valid in this context. The results obtained here are quite decisive as to the sign and magnitude of the overall effect: at the level of aggregation considered, a one-percent capital-inflow relative to GDP adds 0.42 percent to the export growth rate.

This effect also goes a far way to explain country-specific differences in export-growth performance within this group of countries and, in particular, the relatively superior growth-performance of Costa Rica.

This result nevertheless leaves open certain key aspects of the question, specifically as concerns (a) the particular mechanisms through which this effect operates and (b) what appears to be significant leakages in the pass-through from foreign-resource inflows to export growth. This points to a need for further and closer study of the specific role of the different forms and sources of the resource inflow, their impact in different sectors, and how the inflows relate to relieving particular economic constraints affecting domestic saving potential, production technology, supply of technical and managerial skills, and access to credit.

The pattern of performance of different economic sectors, in terms of their net marginal contribution to overall export growth as estimated in this analysis, varies significantly. Agriculture and services have made unambiguously positive contributions. On the negative side, and equally unambiguous, is the minerals sector, a result which provides strong support for the existence of a "Dutch disease effect" associated with negative spillovers from this sector. Negative contributions (with somewhat weaker estimates) are found also for manufacturing and the infrastructure sector.

As to the contribution of social infrastructure (human resources and social services), evidence is found of significant underutilisation of the existing productive potential in these areas. It turns out that this contribution, as measured here, is zero or negative. This unusual result emphasizes a general insufficiency condition, namely, that it is not sufficient to have good social infrastructure to start with. It is also necessary that this social infrastructure is effectively utilised through growth of employment and demand for skills, i.e. through human-resource-intensive growth.

The size of resource endowments in terms of the ratio of arable land to population appears to play a significant positive role. Viewed the other way

round, this result suggests that there may be static diminishing returns from the pressure on arable land in some of the countries.

On the other hand, no support is found for the view that small size, as measured by the size of GDP, is a handicap for export performance. To the contrary, it appears that, within the range of sizes of this sample, it is a positive factor.

Weakly positive contributions are associated with government size and with the ratio of net investment to GDP.

Import protection, as measured by effective rates of protection, has been a negative factor in export growth.

Finally, the surprising result is found that risk, as measured by the variance in exchange rates, has not been an inhibiting factor in export performance.

Taken together, these results provide a useful focus for discussion of the requirements of current economic policy oriented towards enhancing export performance. They also provide clear pointers as to meaningful directions of future research.

Acknowledgements

In the course of pursuing this study, I have become indebted to a large number of individuals for sharing with me discussion, data, and analysis, on the problems and issues and country specifics related to the study. I take this opportunity to express my appreciation and thanks to all of them.

The project has benefitted from the support and encouragement I received from members of the staff of the Inter-American Development Bank during my stay as a Visiting Scholar.

I received the very able research assistance of Ivan Guerra who skillfully managed much of the computer work at the IDB. My research assistant at Stanford, Bruce Donald, provided me with very helpful back-up support.

In the individual countries, many persons, too numerous to mention, provided help during the time that I spent there trying to sort out the issues and the data at first hand.

A travel grant from the Center for Latin American Studies at Stanford University enabled me to cover a lot of ground.

Introduction

In a previous paper (Harris, 1994a), it was found that the Caribbean countries have shown rather weak performance in terms of overall export growth relative to other countries and regions in the world economy. Moreover, it was found that these countries had certain definite advantages inherent in their initial situation in the 1960s that gave them an edge relative to other countries that have since become more successful in export growth and development. It appears, then, that the Caribbean countries have failed to utilize effectively those advantages so as to maintain their early lead, and in the process, have fallen behind. There exists here an anomaly that calls for further analysis.

How then do we explain the export performance of these countries? In this paper an effort is made to come to grips with this question.[1] First, the role of external factors is reviewed. This side of the matter is singled out for attention because of the prominence usually given to it in existing discussions. Then, an analytical framework is developed which isolates for closer analysis a set of factors that may be considered to explain export performance. A key variable to be examined is the real exchange rate, which is suggested by both standard economic theory and evidence from other countries and is considered a major factor in contemporary policy discussions. It is supplemented by a wide range of other factors related to structural and behavioral features of the economies and their initial conditions in the 1960s.

Role of External Factors

The issue to be addressed is: how favorable or unfavorable were the external conditions facing these countries in the period under study (1965-90) which could conceivably have had an impact on their export performance?

That these countries suffered some adverse external shocks during this period is well known. These include the two "oil shocks", the spike in

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1 This paper is part of a larger project described in Harris (1993b). The focus is limited here to aggregate exports. It therefore excludes analysis of the composition of exports which is given detailed treatment in the larger study.

international interest rates in the early 1980s, as well as severe hurricanes at various times and, in the case of Costa Rica, the Central American wars. But, to be set against these adverse factors are substantial windfall gains, such as the bauxite levy in Jamaica, the "exceptional financing" obtained by Costa Rica during the 1980s, and the oil shock itself which is clearly a benefit for the oil exporting countries (Barbados and Trinidad and Tobago).

Furthermore, it is the case that some of the same external shocks affected many developing countries at the same time, for instance in the 1980s. Yet, as shown in Harris (1994a), the Caribbean countries underwent a much sharper reversal of trend in export growth in the 1980s than other developing countries. Insofar as external shocks were uniform across countries, or nearly so, this raises the question of why the situation turned out so much worse for the Caribbean countries.

It must be noted also that these countries have had the advantage of special preferential trade arrangements which provided them with guaranteed access through quotas to export markets in North America (under CBI and CARIBCAN) and in Europe (under the Lome agreement).

This issue of the role of external factors is not, then, a clear-cut one, and evidently requires further analysis. Among the relevant external factors, some important factors considered here are the following:

(1) the balance of payments

(2) export prices

(3) the terms of trade.

The Balance of Payments

The current account balance in the balance of payments provides a readily available measure of the overall size of foreign resource inflows.[2] Summary data

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[2] The current account balance is defined here as the balance of payments on current account excluding unrequited transfers (see IMF, Balance of Payments Statistics Yearbook, 1993). As a matter of balance in the accounts, this total must match the sum of unrequited transfers plus capital account balance (including reserves) plus net errors and omissions. For measuring foreign resource inflows, inclusion of reserves may be considered somewhat arbitrary. Net errors and omissions, as a residual category, is a mixed bag of

on the balance as a percent of GDP are presented in Table 1. It is evident that four of the five countries, with the singular exception of Trinidad and Tobago, have had persistent negative balances on current account throughout the entire period 1965-92. Barbados had the largest negative balances of all in the 60s and 70s, but the level fell quite sharply in later years. Three of the other countries had high and growing levels throughout most of the period. For these four countries, the average size of the balance for the whole period exceeds that for the Latin American region as a whole by at least one-third. In some cases, it is as high as two to three-and-a-half times the Latin American average in the sub-periods. The case of Trinidad and Tobago is an exception because the country has benefitted from a boom in foreign exchange earnings from oil exports which, for much of the period, put it in the position of being a net exporter of capital and accumulating substantial international reserves.

So far as the financing of these negative balances is concerned, a large share (from 33 to 56 percent on average for the whole period) is due to net capital flows (including transfers), as shown in Table 2.

As to the composition of the capital flows, it is true that a significant proportion consisted of debt capital made available on terms that became unfavorable for a time owing to the spike in interest rates. The sheer size of debt and costs of debt service are often argued to have imposed a "debt burden" on the borrowing countries. But whether or not debt service becomes a "burden" has to be examined in relation to the economic performance associated with the uses made of the debt. Specifically, it is a matter of the net incremental productivity of expenditure from the loan funds. It is this performance factor which governs the capacity to pay debt obligations. This factor, in turn, is an aspect of internal allocation decisions and policies pursued within each country. Thus, the existence of foreign debt, by itself, cannot be judged to be

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components; but it undoubtedly includes some capital flows, especially "capital flight" which is notoriously difficult to measure (see Cuddington, 1986; Dornbusch, 1990). For some purposes, one may want to use the narrower measure of net capital flows, defined as the sum of unrequited transfers plus capital account balance (excluding reserves) plus net factor payments. This measure is used in the analysis presented below.

necessarily an unfavorable factor and, if it becomes a burden, that has to be traced at least in part to internal factors.

At the same time, one must take account of the substantial inflow of unrequited transfers, in the form of foreign aid and remittances, which these countries have received. As indicated in Table 3, this inflow was at fairly high levels in relation to GDP. Measured in terms of the average percentage for the whole period and excluding Trinidad and Tobago, it was higher in all cases than that for Latin America and the Caribbean. It also accounted for a very high proportion (from 40 to 110 percent) of the overall capital inflow. In the specific cases of Costa Rica, Dominican Republic, and Jamaica, there was a marked increase during the period of the 80s and early 90s.

Thus, the inference can be made that, on average, viewing the period as a whole, there has been substantial inflow of foreign resources into these countries. Therefore, so far as this factor is concerned, it must be judged to have been quite favorable.

Export Prices

In order to clarify the behavior of export prices, it is useful to disaggregate the overall growth rate of exports into the change in export volume and the change in export prices. Call these two components, respectively, a volume effect and a price effect.

Using the available data, the price effect is measured by the average annual growth rate of the implicit deflator of exports of goods and non-factor services in US dollars and the volume effect by the growth rate of the deflated export value series (exports in constant prices). Table 4 shows the results of this disaggregation for the period 1965-90 for the individual countries. For comparison, the averages for 24 countries in the Latin American region as a whole (including the five Caribbean countries) are also included. It is evident that

the price effect represents a substantial proportion of the growth in exports.[3] It varies from a low of 42 percent in Costa Rica to a high of 85 percent in Trinidad and Tobago. The last column shows the index of price responsiveness computed as the ratio of the volume effect and price effect. One might interpret this index as a measure of the overall responsiveness of export volume to price changes. It is not, strictly speaking, a direct measure of the supply elasticity of exports. But, considered as a first approximation, it points to a certain weakness in the response of export supply to price increases. The index is below one, the inelastic range, in four of the five countries. Only Costa Rica, with an index of 1.36, shows an elastic supply response in this sense.

The same disaggregation was done for all 24 countries taken individually. The resulting scatter of points is displayed in Figure 1. The 45-degree line divides the sample into two regions: one with inelastic supply response above the line, the other with elastic supply response below the line. Of the 24 countries, 16 fall in the inelastic region (4 of them with negative supply response) and 8 in the elastic region.

The results of a cross-section regression analysis relating the price effect and volume effect for the 24 countries and for different sub-periods are shown in Table 5. These results confirm the existence of a negative relation between price effect and volume effect across countries. It is interesting also that this relation turns out to be strongest for the sub-period 1970-80. The sub-period 1970-80 was a period of world-wide boom in export earnings. It now appears that, for the countries in this sample, price increases were a major factor in this boom.

These results display an intriguing pattern. They suggest that there exists a low degree of overall price responsiveness, or a high degree of price inelasticity of supply, in these economies. This, in turn, would point to

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3 The conversion of export values from local currencies to US dollars removes the influence of domestic inflation in each country from the price effect as measured here. An additional conversion, for instance by dividing by the GDP deflator for the US, would further refine this measure as one of relative price changes. But this refinement does not appear to make much difference in the relative magnitudes involved.

internal conditions as a major source of factors determining export performance. Certainly, this pattern of large price increases accompanied by low supply response is typical of a "commodity boom" associated with a certain class of primary commodities characterised by low elasticity of supply. Insofar as the composition of a country's exports is heavily weighted with such commodities, this would show up in the pattern of aggregate export performance. What then is at issue is not only the price responsiveness of specific export commodities but also the degree of diversification in the mix of exports and, hence, the specific pattern of commodity specialization in each country.

Of course, it is not uniformly the case that all primary commodities have a low elasticity of supply. Estimates from other studies indicate that the price elasticity of supply varies significantly among different primary commodities and commodity-groups.[4] A case-by-case analysis of commodities composing the mix of exports is therefore required. These are all matters, then, which require more detailed analysis. The results presented here definitely point in that direction. These matters are taken up in Harris (1994b, 1994c).

Meanwhile, one thing does seem clear from these findings. Whatever may be the underlying price-volume relation at the level of specific export products, there is an evident weakness in the carry-over from export-price increases to growth in the overall volume of exports in some of the countries. This weakness shows up, to one degree or another, in those countries lying above the 45-degree line in Figure 1, and it is a characteristic of four of the five Caribbean countries in the sample used for this study. In the specific case of these countries, what these results suggest, then, is a failure of the internal transmission mechanism to create a positive feedback from increase in export prices to the growth of export volume. This failure is one of the key issues that needs to be addressed in considering their long-term export performance.

The Terms of Trade

The terms of trade presents a different dimension of the external situation

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[4] See, for instance, Lord and Boye (1991).

facing these countries by, so to speak, adjusting the movement in export prices for changes in import prices.

The available data on the terms of trade are assembled in Figures 2 through 7 for the five countries and, as a point of comparison, for non-oil developing countries (NODCs) as a group. In the early part of the period, up until the mid 1970s, there is a clear upward trend in the terms of trade for four of the sample countries, while the picture for Costa Rica is somewhat mixed. A sharp turning point occurs in all countries somewhere around 1974-76. After this, and for the next ten years or so, there is a tendency for decline in the terms of trade, Trinidad and Tobago being an exception during the phase of boom in oil prices. A recovery begins in the second half of the 1980s, but it is uneven over time and across the different countries.

So far as year-to-year movements are concerned, there is clearly evidence here of terms of trade shocks, in the sense of sharp, presumably unanticipated, changes in the terms of trade. But it is a mixed picture overall, consisting of both negative and positive shocks at different times, some of them being quite large and sustained over many years. A broadly similar pattern shows up in the terms of trade for the NODCs, so that the Caribbean countries are not to be considered unique in this respect. The coefficient of variation provides a useful measure of the amplitude of such shocks. Calculation of this coefficient for the terms of trade and export prices for different periods yields the results shown in Table 6. The highest coefficients for the terms of trade (at least twice as high as the low end for the sample) are found in Barbados (in the 70s) and in Dominican Republic and Trinidad and Tobago (both in the 80s). Costa Rica and Jamaica are at the low end of the scale. The coefficient for the NODCs is uniformly lower still, than for all five countries, so that the Caribbean countries may be considered to have faced a relatively more volatile situation as regards the terms of trade. On the other hand, export prices were less volatile in the Caribbean (except for two of the countries).

What about the movement in the terms of trade for the period as a whole? Is there any clearly discernible trend, favorable or unfavorable? To test for

this effect, a regression analysis was done using a semi-log specification of the terms of trade against a time trend for the period 1968-91. The results are reported in Table 7. The coefficient on time is positive but not significant for Barbados. It is negative and weakly significant (at the 0.20 level) for Trinidad and Tobago. It is negative and highly significant for the other three countries. One may conclude, therefore, that these three countries definitely experienced an adverse movement in the terms of trade over the period as a whole; the other two averaged out at a more or less even level. In comparison, the NODCs as a group had a significant negative trend but the rate of decline (as measured by the coefficient on time) was lower on average than for the three Caribbean countries.

Thus, as concerns the overall trend in the terms of trade, it appears that, relative to the rest of the developing world, three of the Caribbean countries fared worse than average, the other two fared better than average.
It is interesting also that, among the two that fared better than average, is the country that had the lowest growth of exports (Trinidad and Tobago). Among the three that fared worse than average are the two countries with the highest growth of exports (Costa Rica, Dominican Republic). In this respect, it seems that the long-term trend in the terms of trade was such as to benefit the low-growth countries and to handicap the high-growth countries.

Analytical Framework

In seeking to account for the observed export performance of the Caribbean countries, it is useful to proceed now to a more analytical level. In so doing, one is guided both by theory and by empirical considerations.

A theoretical model of output and investment behavior of export producers is presented in Harris (1993a) which serves as a guide to empirical analysis of the determinants of export performance. This model has the advantage that it identifies the key variables that matter from the standpoint of the decision-making process of exporting firms. Ideally, one might seek to test directly such a model. However, owing to data and resource limitations it was decided not to

pursue this route. The focus here is on the determinants of aggregate exports. Accordingly, a framework of analysis is developed in this section which takes as its starting-point the simplest model of export determination in which the key variable is the real exchange rate. This model is then extended to take account of a range of other relevant variables.[5]

In the currently received and widely accepted theory of the "small" open economy, the real exchange rate (RER) is the key variable that adjusts to maintain simultaneously internal and external equilibrium of the economy in response to exogenous shocks.[6] Movements in the equilibrium value of that variable are linked, in turn, to changes in certain "fundamentals", including real interest rates, terms of trade, import tariffs, export taxes, long-run "sustainable" level of capital flows, and level of productivity (technology). The RER is conceived also to be the point of convergence and main transmission mechanism for operation of many of the instruments of economic policy. The policy effects work through variables that directly or indirectly influence the real exchange rate, such as the nominal exchange rate, domestic price level,

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5 At this level of aggregation, one is properly dealing with the economy as a whole. Consequently, issues of endogeneity and simultaneity among variables in the analysis arise in this context which are of less concern in partial equilibrium analysis. The basic analytical procedure adopted here is to formulate and specify a supply function for aggregate exports that is estimated by single equation methods (ordinary least squares). Concern for a simultaneity problem centers on the possibility that estimates of the supply function may be biased and inconsistent if the independent variables are not truly independent and exogenous but, rather, are endogenous and interdependent elements of a more complete model. It is argued that there are strong grounds to suppose that, in the specific context of these economies, feedback effects from the dependent variable to the independent variables are negligible, so that a simultaneity problem arising from this source may be justifiably ignored. There exists a battery of statistical tests that could be used to test directly this assumption, but this matter is not pursued here. It is an obviously useful direction for future research. In other work, reported in Harris (1994c), it is found that use of simultaneous equation methods for estimating the export supply and demand functions as a way of dealing with simultaneity of quantities and prices yields inferior results compared with single equation methods. Thus, as a practical matter, one may well choose to settle for the single equation approach. The relevant theoretical, econometric, and empirical issues involved in this area are well surveyed by Goldstein and Khan (1985).

6 For explicit statements of this theory, see for instance Edwards (1989), Krueger (1983), Williamson (1983).

nominal interest rate, tariff and tax rates, exchange controls, and capital controls. In these respects, the time path of the actual RER is affected by both policy-induced changes and exogenous shocks while the equilibrium rate is governed by the fundamentals.

Changes in RER in turn affect exports for many reasons. In particular, RER is, by definition, a relative price, i.e. the relative price of tradables and nontradables. As such, one of its strongest effects follows from its role in the profit-maximizing output and investment decisions of firms, as shown in the model developed in Harris (1993a). Exports respond to changes in the RER because of the direct effect on relative profitability of production and investment in tradables vis-a-vis nontradables. In addition, volatility in nominal and real exchange rates may increase perceived uncertainty and risk on the part of investors and thereby reduce investment and output in tradables. There are effects that operate also through consumption and saving decisions.

Of course, causation may also run in the opposite direction, from exports to the RER. For instance, export growth may be associated with stronger productivity-improving effects in tradables than in nontradables within a country and with differential productivity effects across countries, thereby altering one of the fundamentals, i.e. relative productivity levels, which determine the RER as an international relative price.[7] The two-way effect may also work through the policy response mechanism such as, for instance, if tariffs are raised when there is a balance of payments crisis associated with reduced exports. In these respects, a problem of simultaneity may arise in this simple model. However, for reasons that will be indicated in a moment, it is possible to regard these feedback effects as being of small and negligible order of magnitude.

In applying this simple conventional model to the concrete context of the economies studied here, a number of modifications seem necessary in order to give

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7 That there are such productivity effects tied up with export growth is commonly argued in the recent literature on endogenous technical change and in empirical work. These effects are attributed to a number of different factors, such as economies of scale, capacity utilization, learning, and international transfers of knowledge and technology. For a relevant discussion in the context of developing economies, see for instance Pack (1992).

recognition to the specific conditions and circumstances of such economies.

The first modification arises from the existence of factors which create the possibility of incomplete adjustment of the actual RER to changes in the fundamentals. These factors are due, in the first place, to the nature of the nominal-exchange rate regime. Throughout the period under study, the regime instituted in these countries has taken different forms, ranging from fixed nominal parity (or its variants such as crawling peg and managed float) to non-unified rates and auction systems, sometimes with exchange controls, and with coexistence of a parallel market alongside the official market.[8] In recent years, with the introduction of various economic reforms, the exchange- rate regime has moved towards a relatively more open and flexible system. But, so far as the predominant regime in earlier years is concerned, and perhaps even today, it is evidently characterized by a high degree of inertia in the adjustment of the nominal exchange rate. Consequently, adjustment may be delayed and, when it comes, may take the form of undershooting or, perhaps, overshooting in response to a perceived "crisis".[9]

This tendency is apparent from inspection of actual trends in the nominal and real exchange rates depicted in Figures 8 through 13.[10] The clearest case is that of Barbados where the nominal rate has been held virtually constant for

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8 For a survey and classification of the types of exchange-rate regime prevailing in each of the countries and at different times, see International Financial Statistics, various issues.

9 The question of the causes of such inertia is an interesting one in itself that is worth further consideration from the standpoint of the underlying political-economic factors but is not explored here. It could be argued, for instance, that such inertia may be well founded as a rational response to the costs (economic and political) involved in full and continuous adjustment. On this see, for instance, Dixit (1992), where the case for hysterisis is argued for investors in competitive markets and could, in principle, be applied also to decision-makers in the state sector.

10 The real exchange rate is defined in these Figures as the bilateral nominal rate in relation to the US dollar (annual average) times the ratio of US prices (wholesale price index) to domestic prices (CPI). In the analysis reported below, a more refined measure is used, defined as the trade-weighted multilateral nominal rate (relative to a basket of foreign currencies) times the ratio of trade weighted external prices to domestic prices. On these definitions, a rise in the rate represents a depreciation and a fall is an appreciation. Data are obtained from the IDB data base.

most of the period while the real exchange rate has been appreciating in a manner that seems inconsistent with known trends in that country's fundamentals. In contrast, Costa Rica, Dominican Republic, and Jamaica, after a long period of constancy in the nominal rate, eventually adjusted (in the presence of a crisis in each case) through large devaluations followed by smaller ones or by a crawling peg. These adjustments resulted in substantial real depreciation, followed by a subsequent sharp reversal of direction, but with a continuing real depreciation afterwards. In Trinidad and Tobago, there were mini-devaluations in the period leading up to the late 70s but, after a phase of substantial real appreciation during 1978-85, there were successive sharp devaluations which, for a time, reversed the movement in the real exchange rate, though only up to a peak in 1989 that was well below the average level existing in the earlier period 1968-78.

Apart from the nominal exchange-rate regime, there is a second set of factors, associated with the institutional structure of these economies, specifically the structure of capital markets and labor markets. Domestic capital markets are generally considered to be "repressed" and non-competitive and face rationing in the international credit market. These features would tend to weaken the transmission mechanism that is supposed, in the conventional model, to transmit external shocks and changes in fundamentals to changes in RER through adjustments in saving and investment in response to interest rate changes.[11] Labor-market rigidities arising from the existence of strong labor unions may have a similar effect in dampening the adjustment that occurs through wage and price changes.

Insofar as these two sets of factors are operative and effective, this implies also that feedback effects from export growth to changes in the RER are correspondingly damped, perhaps reduced to a negligible order of smallness. To

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11 Quite apart from the issue of imperfections in the capital market, the adjustment in intertemporal consumption (i.e. saving) that the conventional model supposes to occur (see Edwards, 1989, ch. 2) may not occur for the simple reason that income and substitution effects cancel each other. Furthermore, this adjustment may be doubted on empirical grounds, since the weight of existing evidence from empirical studies suggests that the interest elasticity of saving is vanishingly small and may be zero.

that extent, the possibility of a simultaneity problem in estimating the export growth equations may justifiably be ignored.

The second modification of the conventional model that seems necessary is due to the presumed operation of a "foreign exchange constraint" in the context of these economies.[12] There are several different possible grounds for this presumption. One concerns specific characteristics of the production system which, it is argued, limit the possibilities of adjustment on the production side. These characteristics include the absence, or relatively small capacity, of a domestic capital-goods industry and the limited supply and variety of domestic raw materials required for industrial production. These may be accompanied by technological complementarities or limited possibilities of substitution in production, though this condition is not strictly necessary to the argument. There may also be limitations in the domestic supply of technical and managerial skills. The key point is that export expansion is predicated on access to a wide range of productive inputs (machinery, raw materials, fuel, technical and managerial skills) that must necessarily be imported. In this sense, production is import-constrained.[13] In this context, if the constraint is binding, the volume of net foreign exchange inflows may be supposed to play an independent role in determining the capacity for adjustment on the production side by relieving that constraint.

Alternatively, the constraint may be based on the condition of a limited domestic saving potential. In this case, foreign capital inflows serve as a supplement to domestic saving, enabling a higher rate of accumulation and, correspondingly, a higher growth rate of exports. Another possible basis for the constraint relates to a strictly financial condition associated with the

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12 The idea of a foreign exchange constraint in economic development was developed in an earlier literature. See, for instance, Chenery and Strout (1966), McKinnon (1964). In an analysis of data for Jamaica, Harris (1970) found that different conditions may constitute the binding constraint at different times.

13 For an analysis of the macroeconomic implications of this type of production constraint, in the context of both short-term adjustment and growth, see Harris (1990).

structure of capital markets and arising, in particular, from the conditions of access to credit. Insofar as access is limited, i.e. credit is rationed, for whatever reason, the inflow of foreign capital may be supposed to have an independent influence on the credit constraint and, hence, on export growth.

It is not a matter of indifference which of these different conditions is supposed to constitute the binding constraint. From a policy perspective, it would be a crucial issue to be determined. For some analytical purposes, it may also be necessary to distinguish between them. However, in the present analysis, it is left as an open question. The relevant point in this context is that they all imply the hypothesis of a positive effect of foreign resource inflows on export growth following from relieving one or another binding constraint.[14]

Of course, the contrary hypothesis could be advanced, and it is sometimes argued in the policy debate, that foreign-resource inflows may have a negative effect. Instead of serving to relieve a supposed constraint, they generate negative spillovers and substitution effects, depending on the particular form of the inflows and the specific allocation decisions made in using them. For instance, foreign direct investment in high wage sectors may push up wages in other sectors and induce transfers of skilled labor from other activities, thereby causing reduced output in those sectors and activities. Or, the inflow of foreign capital may induce a substitution effect such as to reduce domestic saving and increase consumption. Foreign loans and grants may be used to finance inefficient public-sector enterprises and government deficits arising from consumption expenditures. Such negative effects, among others, are typically associated with the widely discussed phenomenon of "Dutch disease". Caribbean countries may not, in fact, be immune to this disease.

So far as the role of foreign resource inflows is concerned, then, there are two competing hypotheses that are relevant. It is useful to try to determine which of these applies to the case of these countries.

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14 Export growth may itself be supposed to push out the binding constraint. But the hypothesis entails that this is a gradual process and the constraint would only disappear as a result of the long-term development and transformation of the economy.

The Estimated Models

The preceding considerations lead to specification of the following sequence of models which are to be estimated. The basic model is as follows.

$$(1) \qquad g_x = a_1 + b_1 DRER + c_1 TIME + \Sigma_i d_{1i}(\text{Country Dummies}) + \varepsilon_1,$$

$$b_1 > 0,\ c_1 = ?,\ d_{1i} = ?$$

where

g_x = rate of growth (percent per year) of exports of goods and non-factor services in constant US dollars
a_1 = constant
DRER = rate of change (percent per year) in real exchange rate
TIME = index of year
i = (1,...,4) = BRB, CRI, DOM, JAM
ε_1 = error term

In this model, the variable DRER represents short-term (annual) changes in RER and the sign of its coefficient is expected, according to theory, to be positive. It is assumed, for the reasons indicated above, that short-term changes in RER are incomplete adjustments to changes in the fundamentals. Consequently, the trend variable TIME is introduced to capture the residual effect of long-term changes in the fundamentals that are not accounted for by DRER. The sign of this effect is unknown a priori and remains to be empirically determined. The country dummies (normalised with respect to Trinidad and Tobago) are intended to pick up differences in country economic structure affecting export performance. The sign of their coefficients is also unknown.

Next, this basic model is extended to allow a further specification of changes in fundamentals that are possibly not captured by either DRER or TIME, but which may have an indepenent role as "external factors" determining export performance. These variables are introduced in successive steps as separate additions to the basic model.

First is the terms of trade, as represented by:

DTOT = rate of change (percent per year) in the terms of trade.

Its coefficient is expected to have a positive sign. Like RER, the terms of trade is a relative price (of exports and imports) and operates through a direct effect on profitability of production and investment. But in this case, it is an effect within tradable goods. Insofar as a wide range of productive inputs are imported in these economies, this variable represents a key element of costs for producers. There are effects that operate also via consumption and saving.

Second, the role of foreign resource inflows is introduced. It is represented by:

$FRIN_{-1}$ = net foreign resource inflow, measured as the ratio of net unrequited transfers plus net capital flows plus net factor payments to GDP, lagged one year.

This variable is specified with a one-year lag in recognition that, in its role as a foreign exchange constraint on the production side, it is associated with a time delay from the ordering and delivery of inputs to start-up of production.[15] A similar lag may exist, though perhaps of different duration, if the constraint is associated with limits to domestic saving or with credit rationing. The coefficient of this variable is expected to be positive, if in fact foreign resource inflows serve as a supplement or complement to domestic resources. However, it is also conceivable that it could be negative if such inflows generate negative spillovers and substitution effects.

Finally, an attempt is made to examine the role of specific country characteristics considered relevant to export performance. This is done by substituting for the country dummies a number of different variables, one at a time, each representing measured characteristics of each country. The variables chosen for analysis fall into two sets. One set relates to characteristics of the economic structure prevailing in the initial period 1965-70. The other relates to contemporary factors operating during the period 1965-90 and measured

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15 Use of the lag should also serve to dispel concern about a simultaneity problem with regard to this particular variable. In any case, it could be argued, of course, that in these countries inflows of foreign direct investment, aid, and remittances are exogenous factors from the standpoint of the short-term adjustment process. This argument would obviously not appply to the case of short-term credit, but that is a relatively minor component of the aggregate inflow.

in terms of their average level over this period. All of these variables have a presumptive significance for export performance, even though the expected sign of the respective coefficients may not be predicted exactly in all cases. These variables are defined as follows.

Initial Conditions (annual average, 1965-70)

AGRGDP1 = Ratio of agricultural sector to GDP

MINGDP1 = Ratio of minerals sector to GDP

MANGDP1 = Ratio of manufacturing sector to GDP

SRVGDP1 = Ratio of services sector (excl. govt.) to GDP

INFGDP1 = Ratio of infrastructure sector (utilities, construction, transportation) to GDP

RKAVG = Average rank in initial conditions (1965)

RKED = Initial rank in education (1965)

GDP1 = Level of GDP (in 1988 US dollars)

POPDEN = Population density per km^2 of agricultural land (1965)

Contemporary Conditions (annual average, 1965-90)

GVTGDP = Ratio of government sector to GDP

NIGDP = Ratio of net investment to GDP

CVNER = Coefficient of variation in nominal exchange rate

CVRER = Coefficient of variation in real exchange rate

ERP = Effective rate of protection (selected years)

The regression equations representing the different specifications described above are estimated from pooled cross-section and time-series data covering the period 1965-90 for the five countries. Estimation is by ordinary least squares in all cases. In addition, a subset of the equations is estimated with a Cochrane-Orcutt adjustment for serial correlation of the error term. If shocks are present, it is presumed that they should show up in the form of serial correlation. Accordingly, the size of the estimated autocorrelation coefficient, rho, may be taken to be indicative of the presence of shocks. Of course, if the

estimated value of rho turns out to be significantly different from zero, this may indicate a number of different possible causes of autocorrelation such as, for instance, specification error due to omitted variables. In this respect, it is only a preliminary test, but it is still a useful first step, in assessing the dynamics of the process governing export growth. Besides, regardless of the source of autocorrelation, this adjustment does serve to correct for bias in the estimated coefficients and standard errors due to serial correlation.

Results of the Analysis

The results of the regression analysis are presented in Tables 9 through 13. These results are the focus of discussion in this section.

It turns out that no more than 14 percent of the variation in the export growth rate is explained by the equations, as indicated by the coefficient of determination. Though disappointing, this is not a matter for serious concern and, in the context of other studies of this sort (analysis of growth determinants with pooled cross-section time-series data), it is certainly to be considered a creditable performance.

The estimates obtained by using an autocorrelation adjustment (see Table 10) yield a value of rho (the autocorrelation coefficient) that is in all cases zero or negligible. Therefore, it appears that, on average, exogenous shocks may not be an important factor in the dynamics of export growth in this group of countries (to the extent that such shocks are detectable by this method).[16] Additionally, this result may be taken to mean that the problem of specification

16 It must be emphasized that this inference relates to the average performance of this group of countries. However, from the estimated equations (not reported here) for individual countries in the group, it appears that there is some residual volatility in the errors. The estimated value of rho turns out to be negative and statistically significant for Dominican Republic, Jamaica, and Trinidad and Tobago, ranging in absolute value from 0.11 to 0.39 (with the largest values for Trinidad and Tobago). For the other two countries (Barbados and Costa Rica), rho is positive (in the range 0.05 to 0.19) and not significant. It might be thought that this sort of saw-tooth pattern of errors (negative rho) is due to a missing variable that exhibits the same pattern. The variables DRER and DTOT evidently qualify for this but they do not suffice to remove the volatility. Since the three countries for which this pattern exists are all mineral-export economies, one may infer that it reflects the export dynamics peculiar to such economies.

error is not a serious one in this analysis.

A striking feature of the results is that the coefficients of both DRER and TIME are highly significant, at the 0.025 level in almost all cases. Furthermore, the size of these coefficients varies very little or not at all between different equations (with the significant exception of equation 3, as noted below), indicating robustness in their explanatory power across the different underlying models.

The sign of the coefficient of DRER is positive, as expected. This confirms that the real exchange rate is an effective stimulus to export growth and that producers are responsive to the incentive that it provides. The size of the estimated coefficient indicates that the marginal effect of this stimulus is large: a depreciation of one percent in the real exchange rate can be expected to produce an increase of 0.17 percent in the growth rate of exports. Or, put differently, it takes a 6 percent real depreciation to get a one percentage point increase in the export growth rate. That order of magnitude of real depreciation is well within the range of observed year-to-year variations in RER in these countries during the period under study. This is evident from the size of the measured coefficient of variation in real and nominal exchange rates shown in Table 8.

Quite remarkably also, the sign of the coefficient of TIME is negative, and is uniformly so across all the estimated equations. This suggests that, insofar as there are changes in long-term factors (or fundamentals) not already absorbed in changes in RER, those factors exercise a definitely negative influence on export growth. Furthermore, the very strength of this residual effect suggests that changes in RER do not, in fact, absorb changes in those factors and, therefore, that those factors may be considered to operate independently of RER. Consequently, this result may be taken to confirm the hypothesis of incomplete adjustment of the actual RER to changes in fundamentals.

There remains an interesting question as to what the factors underlying this negative residual effect might be and whether they can be made more specific. This question can be directly addressed by examining the regression

results obtained from extensions of the basic model to include the terms of trade and foreign-resource inflows (see Tables 9 and 10). It is worth noting that there is no evidence that there exists collinearity of these variables with RER as would occur if RER were truly dependent on these fundamentals.

The coefficient for the terms of trade is positive, as expected. This estimate is, at best, only weakly significant at the 0.25 level, but it might be taken to suggest that those countries which experienced a deterioration in their terms of trade may have suffered a loss of export growth arising from this source. However, the amount of this loss, as measured by the estimated coefficient, is quite small: a one-percent decrease in the terms of trade reduces export growth by only 0.03 percent. Calculation of the actual time trend in the terms of trade for these countries shows at most a two-percent annual rate of decrease (see Table 7). In any case, it is clear that introduction of the terms of trade variable has no effect on the coefficient of TIME and so the negative residual effect remains.

The coefficient of foreign-resource inflows is positive and highly significant (at the 0.025 level). Equation 3, which contains this variable, has the highest coefficient of determination. It is interesting also that the addition of this variable reduces significantly the size of the estimated coefficient on TIME. It contributes, therefore, to reducing the negative residual effect. Thus, foreign resource inflows have evidently been a significant factor in maintaining export growth in these countries. At this level of aggregation, it is not possible to say in which of various possible routes this effect operates or what are the binding constraints to which it is related. In this connection, fruitful results might be obtained from disaggregating the flows and examining more closely their sectoral impact.

As to the magnitude of this effect, the regression coefficient indicates that a one-percent inflow of foreign resources (relative to GDP) increases the growth rate of exports by as much as 0.42 percent. To place this estimate in proper perspective, it is useful to introduce the concept of a net incremental exports/foreign capital ratio (which is analagous with the familiar concept of

incremental output/capital ratio or IOCR). This ratio (call it XFCR) is a measure of the net pass-through (direct and indirect) from foreign resource inflow to exports, after taking account of leakages of all sorts.[17] It is easily proved that, in the present model, XFCR is equal to the regression coefficient multiplied by the share of exports in GDP. Using the mean share of exports in GDP for these countries, which is 40 percent over the sample period, this calculation yields the result:

XFCR = 0.168 (net incremental exports/foreign-capital ratio)

Typical estimates of the incremental capital/output ratio are in the range of 2 to 4.[18] This gives a range of 0.25 to 0.5 for IOCR. The estimate of XFCR is well below this range. This difference is not necessarily to be interpreted as poor performance. For instance, at the yield-rate of 16.8 percent in terms of foreign exchange earnings, these countries can afford to service debt obligations at the historical average rate on foreign loans. Nevertheless, it is instructive to consider what may account for the difference. Evidently, the leakages would lower XFCR relative to IOCR. On the other hand, capital productivity in exports tends to be higher than in other lines, and this would raise XFCR relative to ICOR. Therefore, this suggests that, on balance, the leakages may be quite large. It follows also that, from the standpoint of the goal of export growth, there exists here a significant potential for further gains from increasing the payoff from foreign resource inflows by reducing the leakages.

Despite the explanatory insights gained from introduction of these variables, these results still leave a significant, unexplained, negative residual effect. This leads to the conclusion that one must look elsewhere to

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17 These leakages would include any diversion of the resource inflows into private consumption, financing of government deficits for consumption purposes, investment in inefficient enterprises (public and private) and in production of non-tradables not linked to exports. In principle, this measure would also include indirect effects on export production induced by the resource inflows, such as the substitution of consumption for domestic saving and negative spillovers on existing lines of export production.

18 For instance, Harris (1970, p.161) reports an estimate of 2.23 for Jamaica.

find an explanation for this effect. In this regard, it may be suggested here that what the negative coefficient on TIME points to is an underlying tendency to deterioration in the export competitiveness of the Caribbean countries. This tendency may be linked, in turn, to a variety of internal or supply-side factors that need to be further examined. From the preceding analysis it does appear that external factors, at least those considered here, are not strictly adequate to account for this effect.

So far as the role of country-specific factors is concerned, the country dummies provide some limited indication. The most significant and largest coefficient is that for Costa Rica. Next in size are the coefficients for Dominican Republic and Barbados (in that order) and they are only moderately significant. The coefficient for Jamaica is the smallest and not significant. These results thus serve to confirm that there exists significant residual differences in growth performance among these countries (in terms of their respective relative contribution to the average growth rate of the group) after taking account of the preceding explanatory factors. They also confirm a certain ranking of the countries in terms of growth performance, with Costa Rica as the leader of the group.

However, it is quite striking that, in equation 3 (Tables 9 and 10), addition of the variable $FRIN_{-1}$ reduces substantially the size and statistical significance of all the country-dummy coefficients. This result gives further support to the strong contributory role of foreign resource inflows. In particular, it implies that, whatever may be the country-specific effects at work, these effects may be explained just as well by foreign resource inflows. Correspondingly, one may infer that the relatively stronger growth-performance of the leading country, Costa Rica, is attributable in large part to the role of this factor.

The preceding results go a far way towards explaining export-growth performance in this group of countries. Nevertheless, it is worth exploring further some of the particular factors underlying these country-differences. One can gain some insights about this from examining the effects of introducing into

the basic model (equation 1) specific measured characteristics of each country as substitutes for the country dummies. The results of this step in the analysis are shown in Tables 11 through 13. The explanatory significance of the basic model is not much improved and equation 3 (Tables 9 and 10) still has superior fit. But, altogether, there are some interesting results here, some expected as well as some surprises, as indicated in the following comments on each variable.

Initial Structure of Production

Of the various production sectors specified, agriculture and minerals have the highest significance (at the 0.01 and 0.025 levels respectively).

The coefficient for agriculture has a positive sign, indicating that initial specialization in agriculture is a positive factor in export growth. This effect is presumably heavily weighted by the role of agriculture as a major component in the relatively high export growth-rate of Costa Rica. The result holds for the agricultural sector as a whole. But different sectors within agriculture may fare quite differently. This becomes clear from disaggregating the performance of agriculture and, in particular, from examining the relative performance of traditional vis-a-vis non-traditional agriculture (see Harris, 1994b, 1994c). The key to the role of the agricultural sector is then seen to lie in the extent of continuing diversification into new products and processing activities. Meanwhile, what this result suggests is that agricultural specialization as such, far from being a handicap, may be a distinctly positive factor.

On the other hand, initial specialization in minerals appears to be a significant handicap: the coefficient for the minerals sector is negative. This result corroborates the finding, obtained in other studies,[19] that some minerals-producing countries have suffered from a "Dutch Disease effect" during periods of boom in their mineral exports. The minerals-producing countries in this sample are Dominican Republic, Jamaica, Trinidad and Tobago. Though each produces a different mix of minerals, they all seem to have experienced a

19 See, for instance, Gelb and Associates (1988).

negative impact of their minerals sector on overall export growth.

The result for the infrastructure sector (negative coefficient, significant at the 0.05 level) is an intriguing one. It seems plausible that, if a country has a well developed infrastructure of utilities (water, electricity), construction industry, transportation network, and the like (measured by the ratio of current production in these sectors to GDP), then this infrastructure would be a positive contributing factor to export growth. This result does not support that hypothesis. To the contrary, it suggests that such infrastructure is a negative factor. One may interpret this to mean that, in these countries, the infrastructure sector has diverted resources away from exports and towards the production of non-tradables like residential and commercial construction.

The manufacturing sector also appears to play a negative role (but the coefficient is significant only at the 0.30 level). This may be taken as an indication that manufacturing industries, much of which developed initially in these countries under highly protective import-substituting trade regimes, contributed to diverting resources from exports to production for the domestic market.

The services sector consists of a heterogeneous mix of services, some (like finance, insurance, and real estate) catering to domestic producers and consumers, others (like hotels, restaurants, and entertainment) serving both the domestic market and the tourist sector. It turns out to be a positive factor in export growth. This is, no doubt, a reflection of the strong export performance of the tourist sector in these countries.

Initial Level of Social Infrastructure

The variable RKAVG measures average rank of each country in terms of an index of various initial conditions, consisting of per capita income, education, health, and nutrition.[20] These may be regarded as representing social

20 This index is constructed of nine variables (unweighted), consisting of: (1) GDP per capita; percentage of age group enrolled in (2) primary, (3) secondary, and (4) tertiary levels; (5) pupil-teacher ratio in primary level; population (6) per physician, and (7) per nurse; (8) infant mortality rate; (9) daily calorie consumption per capita. Data are from World Bank data base

infrastructure (human resources and social services). The numerical scale of rank goes from one (highest rank) to five (lowest rank). Therefore, the positive coefficient for RKAVG (significant at the 0.05 level) means that country-rank on this scale is negatively related to export growth. In this sense, the effect of the initial level of social infrastructure is negative. This is a surprising result, in view of the strong positive role usually assigned to this factor (cf. Birdsall and Sabot, 1994). But it is consistent with the finding (reported in Harris, 1994a) that their initial advantage in social infrastructure has not given an edge to the Caribbean countries in economic performance relative to the Asian countries. In this respect, it appears that there has been in these countries a significant problem of underutilisation of their productive potential in terms of social infrastructure.

The initial rank in level of education, RKED,[21] considered as a separate factor, has a negative coefficient, meaning that the contribution of education is positive. However, the coefficient is not statistically significant in this case. This may be regarded as another manifestation of the same problem of underutilisation of existing productive potential in terms of human resources.

Thus, as regards the role of social infrastructure, what these results show is not that the Caribbean countries are a unique exception. Rather, it is that they are examples of a case where the general insufficiency condition holds, i.e. it is not sufficient to have a high level of social infrastructure to start with. It is also necessary that this social infrastructure is effectively utilised through growth of employment and demand for skills, that is to say, through human-resource-intensive growth. For that condition to be met, what matters are demand-side factors that are not considerd here but evidently need further examination.

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and national government sources.

21 This index is constructed from the variables (unweighted) numbered 2, 3, 4, and 5 in the preceding note.

Initial Size of GDP

This variable, GDP1, has a negative coefficient and it is significant at the 0.05 level. The negative sign runs counter to the common presumption that "small size" is a handicap for economic performance in the Caribbean, if size is measured by the aggregate level of GDP. Of course, this result holds within the range of sizes represented in this sample, and many of the other Caribbean countries are smaller than the smallest of this sample. It is not possible to say, without further analysis, if there are nonlinearities in the role of size that come into play outside of this range. However, the high-growth performance in exports of the OECS countries (as described in Harris, 1994a) does suggest that, at sizes even smaller than the range of this sample, export growth is higher still.

Initial Population Density

The variable POPDEN1 serves as a measure of the initial pattern of resource endowments as represented by population size relative to agricultural land. It is evidently a significant factor. Initial population density is inversely related to export performance. This suggests that there may be static diminishing returns from the pressure on arable land in some of the countries. Or viewed the other way round, the size of resource endowments, in terms of the ratio of arable land to population, plays a significant positive role. This feature helps to explain the relatively high-growth performance of Costa Rica. That country, lying at one extreme of the resource endowment, gains an advantage from its larger resource base. Other countries (including Barbados at the other extreme) have a relative disadvantage from their smaller resource base.

Effective Rate of Protection

The effective rate of protection, ERP, measures the degree of openness to trade from the standpoint of the trade barriers constituted by the structure of tariffs and domestic taxes. Historically, these barriers have been quite high in the Caribbean countries. Various studies indicate the following estimates of

ERP (references in parentheses): Barbados 233.7%, Jamaica 162%, Trinidad and Tobago 194.7%, all averages for 1980-92 (Gonzales, 1993); Costa Rica 98.6%, average for 1971-74 (Bulmer-Thomas, 1976); Dominican Republic 162.5%, average for 1985 (Morales, 1986, cited in Contreras, 1994). These are the numbers used in the regression. It turns out that the ERP, as measured, is negatively related to export growth (the coefficient is significant at the 0.10 level). This confirms that protective barriers have been detrimental to export growth in the Caribbean countries.

Size of Government

The size of government, GVTGDP, is positively related to export growth (significant at the 0.10 level). The role of government is, of course, a complex one and mere size, by itself, does not suffice to represent all of its dimensions. It has also undergone significant changes over time in these countries, affecting many areas of government activity, and these changes are not captured in this variable. Nevertheless, this result is an interesting one, certainly from the standpoint of existing policy debates about the size and efficiency of government as contributing factors in economic performance.

Investment

The net investment ratio, NIGDP, is positively related to export growth. This confirms the presumption that investment is a positive factor in growth and, hence, in growth of exports.

Instability, Uncertainty, and Risk

These factors are proxied here by the observed variance (measured by the coefficient of variation) in the exchange rate, both nominal and real, CVNER and CVRER. These variables are commonly deemed to be crucial for economic decision-making in the area of production and investment for export. It is an important question, therefore, whether perceived risk arising from these sources has affected export performance. In the form actually tested here, the issue is

posed in terms of the cross-country difference in exchange-rate risk measured as an average over the period 1965-90. It turns out that the estimated coefficient is positive for both nominal and real exchange rates. This is a surprising result and contrary to what one would expect, albeit that the estimates are not statistically significant.[22] Perhaps this is an indication that the dynamic of expectations associated with these particular variables is not captured with cross-section data and a static model.

Summary and Conclusion

The results of the analysis presented here are of much interest, from the standpoint of both analysis and policy. To summarize, the main findings are as follows.

A highly significant role is found for the real exchange rate. This result confirms the general hypothesis, already supported by studies of other developing economies, that the exchange rate is a crucial instrument for creating incentives to production for export and, hence, for promotion of export growth. In this respect, the experience of the Caribbean countries is very much in line with that of other comparable countries. Moreover, for this reason at least, among others, they cannot be considered a special case or somehow unique because of their "small size".

This generalization holds insofar as actual economic policy pursued in the Caribbean countries and their institutional structure (capital and labor markets) have allowed the exchange-rate mechanism to work. However, this has not generally nor always been the case. Strong evidence is found here to support the hypothesis that operation of the exchange-rate mechanism in these countries is subject to a great deal of inertia, such that changes in the real exchange rate represent incomplete adjustment to changes in the underlying fundamentals. At the same time, there appears to be a significant long-term tendency to deterioriation in the export competitiveness of these countries. This tendency

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22 Cottani et al. (1990) report "a strong negative correlation" between the growth rate of per capita GDP and a measure of real exchange rate instability, based on a regression with cross-section data for 24 developing countries.

is one of the important factors which explains their relatively weak export performance as compared with other countries and regions, including the countries of East Asia.

External factors, such as export prices, terms of trade shocks, and external demand, have not been altogether adverse. In fact, from a close analysis of the available data, it appears that some of these factors have been quite favorable. And, even if adverse, as in the case of the terms of trade for some periods and for some countries, they do not appear to have created a significant handicap for export growth. Rather, it appears that the inhibiting factors in export growth are linked to internal or supply-side factors that need to be further examined. These would involve essentially the internal structure of incentives, as related to the costs that export producers face and the prices that pass through from the export market to the direct producers. The key issue here is one of the anti-export bias of this incentive structure.

Foreign resource inflows into these countries have been sustained at fairly high levels throughout the period, in the multiple forms of direct investment, loans, and transfers (public and private). There is an important question as to what is the net marginal effect of such inflows on export growth, whether it is positive or negative and why, and correspondingly, which of the competing hypotheses about this effect may be valid in this context. On this question, the results obtained here are quite decisive at the level of aggregation considered. There is an indication of a strong positive effect overall, and it is statistically significant. Therefore, the hypothesis that it is zero or negative can be rejected. This effect also goes a far way towards explaining country-specific differences in export-growth performance and, in particular, the relatively superior growth-performance of Costa Rica in this group of countries.

This result, though of much interest in itself, nevertheless leaves open certain key aspects of the question, specifically as concerns (a) the particular mechanisms through which this effect operates and (b) what appears to be significant leakages in the pass-through from foreign-resource inflow to export growth. It points to a need for further and closer study of the specific role

of the different forms and sources of the resource inflow, their impact in different sectors, and how the inflows relate to relieving particular economic constraints affecting domestic saving potential, production technology, supply of technical and managerial skills, and access to credit.

The pattern of performance of different economic sectors, in terms of their net marginal contribution to overall export growth as estimated in this analysis, varies significantly. Agriculture and services have made unambiguously positive contributions. On the negative side, and equally unambiguous, is the minerals sector, a result which provides strong support for the existence of a "Dutch disease effect" associated with negative spillovers from this sector. Negative contributions (with somewhat weaker estimates) are found also for manufacturing and the infrastructure sector.

As to the contribution of social infrastructure (human resources and social services), evidence is found of significant underutilisation of the existing productive potential in these areas. It turns out that this contribution is zero or negative. This unusual result emphasizes a general insufficiency condition, namely, that it is not sufficient to have good social infrastructure to start with. It is also necessary that this social infrastructure is effectively utilised through growth of employment and demand for skills, i.e through human-resource-intensive growth.

The size of resource endowments in terms of the ratio of arable land to population appears to play a significant positive role. Viewed the other way round, this result suggests there may be static diminishing returns from the pressure on arable land in some of the countries.

On the other hand, no support is found for the view that small size, as measured by the size of GDP, is a handicap for export performance. To the contrary, it appears that, within the range of sizes of this sample, it is a positive factor.

Weakly positive contributions are associated with government size and with the ratio of net investment to GDP.

Import protection, as measured by effective rates of protection, turns out

to be a negative factor in export growth.

Finally, the surprising result is found that risk, as measured by the variance in exchange rates, has not been an inhibiting factor in export performance.

Taken together, these results provide a useful focus for discussion of the requirements of current economic policy oriented towards enhancing export performance. They also provide clear pointers as to meaningful directions of future research.

The econometric methods used and the results obtained from them are subject to various qualifications. The regression models assume a linear relationship between the variables, whereas the "true" relationship might be non-linear. Use of the single equation method of estimation may lead to biased and inconsistent estimates if the relationship is simultaneous. The extent of measurement errors in the variables is not known. Nevertheless, despite these qualifications, the results do serve to provide at least a preliminary assessment of the relevance and role of some of the factors that might be thought to account for the aggregate export performance of the Caribbean countries. To my knowledge, this is the first time that this sort of detailed, long-term, comparative analysis has been done in the particular context of the countries of this region. Furthermore, the substantive findings may have considerable relevance to other countries and regions.

Compared with other studies of this type (analysis of growth determinants with cross-section data), that typically cover a very large number of countries, this study has the obvious statistical limitation that it deals with a small sample of only 5 countries. This limitation is offset to some extent by use of a pooled sample of cross-section and time-series data. The models and methodology developed here evidently have general applicability to a wider class of developing economies. It would be a useful exercise to examine whether the results obtained from this analysis carry over to a larger sample.

Table 1

Current Account Balances
(Percent of GDP, Annual Averages)

Country/Region	1965-92	1965-70	1970-80	1980-90	1990-92
Barbados	-10.87	-20.52	-16.14	-3.61	-0.34
Costa Rica	-10.14	-7.91	-11.87	-10.58	-8.10
Dominican Republic	-8.29	-7.00	-7.77	-10.10	-7.49
Jamaica	-11.23	-7.92	-9.54	-14.62	-12.80
Trinidad and Tobago	-1.20	-5.86	1.28	-1.80	3.37
Latin America & Caribbean	-6.28	-6.02	-5.53	-7.04	-6.48

Source: Calculated from IDB data base. Defined as the balance of goods, services, and income, excluding unrequited transfers.

Table 2

Net Capital Flows (including Transfers)
(Percent of GDP, Annual Averages)

Country/Region	1965-92	1965-70	1970-80	1980-90	1990-92
Barbados	6.08	12.18	8.36	2.72	-1.47
Costa Rica	4.50	4.93	8.50	1.45	4.14
Dominican Republic	4.62	4.93	5.38	4.71	3.69
Jamaica	3.66	3.93	2.80	5.24	2.34
Trinidad and Tobago	-2.69	-1.19	-0.17	-4.45	-9.95
Latin America & Caribbean	2.91	1.95	3.90	2.59	2.97

Source: Calculated from IDB data base. Defined as the sum of net unrequited transfers plus capital account balance (excluding reserves) plus net factor payments.

Table 3

Unrequited Transfers (net)
(Percent of GDP, Annual Averages)

Country/Region	1965-92	1965-70	1970-80	1980-90	1990-92
Barbados	2.26	2.98	2.78	1.43	2.33
Costa Rica	1.84	1.03	0.52	3.19	2.97
Dominican Republic	3.89	2.30	2.22	5.34	5.04
Jamaica	4.04	1.15	1.48	6.79	9.19
Trinidad and Tobago	-0.60	0.28	-0.76	-1.00	-0.31
Latin America & Caribbean	1.82	0.96	1.18	2.30	4.43

Source: Calculated from IDB data base.

Table 4

Components of Export Growth, 1965-90: Price Effect and Volume Effect

Country/ Region	Growth Rate of Exports (%)	Volume Effect (%)	Price Effect (%)	(3/1)%	Index of Price Responsiveness (2/3)
	1	2	3	4	5
Barbados	13.00	5.02	7.98	61.41	0.63
Costa Rica	11.26	6.49	4.77	42.38	1.36
Dominican Republic	10.35	4.97	5.38	51.98	0.92
Jamaica	7.08	1.69	5.39	76.11	0.31
Trinidad and Tobago	8.87	1.37	7.50	84.59	0.18
Latin America & Caribbean	13.67	4.81	8.86	64.79	0.54

Source: Calculated from IDB data base. Data for the Dominican Republic cover the period 1968-90.

Table 5

Relation between Volume Change and Price Change

Equation	Period	Constant	g_{px}	R^2	DW	N
1	1965-90	0.0609 (3.46)	-0.3798[4] (-1.57)	0.06	2.06	24
2	1965-70	0.0636 (6.31)	-0.0323[5] (-1.14)	0.01	1.99	24
3	1970-80	0.1282 (5.73)	-0.6580[1] (-3.64)	0.35	2.35	24
4	1980-90	0.0203 (2.20)	-0.5125[3] (-1.72)	0.08	1.92	24

Results of OLS regression for 24 countries in Latin America and the Caribbean, with data from IDB data base. Dependent variable is g_x.
g_x = average annual growth rate of exports of goods and non-factor services in constant 1988 US dollars;
g_{px} = average annual growth rate of price index (implicit deflator, in US dollars) of exports of goods and non-factor services.
Superscripts indicate significance levels: 1 = 0.01, 2 = 0.025, 3 = 0.05, 4= 0.10, 5 = 0.20, 6 = 0.25.

Table 6

Variation in Terms of Trade and Export Prices

	Coefficient of Variation			
	Terms of Trade			Export Price Index
Country	1970-90	1970-80	1980-90	1970-90
Barbados	0.19	0.23	0.13	0.44
Costa Rica	0.16	0.12	0.08	0.27
Dominican Republic	0.25	0.15	0.19	0.30
Jamaica	0.11	0.06	0.07	0.29
Trinidad and Tobago	0.21	0.13	0.27	0.47
Non-oil Developing Countries	0.08	0.05	0.05	0.31

Source: Calculated from World Bank, IDB, and IMF data bases.

Table 7

The Terms of Trade: Estimate of Time Trend, 1968-91

Country	Constant	Time	R^2	DW	N
Barbados	4.77 (49.23)	0.0035 (0.62)	0.03	0.55	24
Costa Rica	5.10 (112.86)	-0.0191[1] (-7.16)	0.69	1.60	24
Dominican Republic	5.28 (52.41)	-0.0199[1] (-3.35)	0.31	0.90	24
Jamaica	4.87 (131.22)	-0.0123[1] (-5.62)	0.57	1.07	24
Trinidad and Tobago	4.93 (47.64)	-0.0068[5] (-1.11)	0.01	0.68	24
Non-Oil Developing Countries	4.82 (167.58)	-0.0086[1] (-5.09)	0.52	0.79	24

Results of OLS regression, with data from World Bank and IMF data bases. Dependent variable is LogTOT. Superscripts indicate significance levels: 1 = 0.01, 2 = 0.025, 3 = 0.05, 4= 0.10, 5 = 0.20, 6 = 0.25.

Table 8

Variation in Nominal and Real Exchange Rates, 1970-92

Country	Coefficient of Variation	
	Real Exchange Rate	Nominal Exchange Rate
Barbados	0.20	0.01
Costa Rica	0.26	1.00
Dominican Republic	0.22	1.19
Jamaica	0.27	1.27
Trinidad and Tobago	0.15	0.31

Source: Calculated from IDB data base.

Table 9

Export Growth Equations

Variable	Equation Number (1)	(2)	(3)
Constant	0.0607[2]	0.0606[2]	0.0573[2]
	(2.29)	(2.27)	(2.18)
DRER	0.1660[2]	0.1747[2]	0.1687[2]
	(1.98)	(2.04)	(2.04)
TIME	-0.0026[2]	-0.0026[2]	-0.0017[4]
	(-2.10)	(-2.10)	(-1.34)
DTOT		0.0346	
		(0.56)	
$FRIN_{-1}$			0.4066[2]
			(2.10)
BRB	0.0286[5]	0.0291[5]	-0.0075
	(1.04)	(1.05)	(-0.23)
CRI	0.0519[3]	0.0522[3]	0.0247[6]
	(1.88)	(1.89)	(0.82)
DOM	0.0429[4]	0.0430[4]	0.0136
	(1.56)	(1.56)	(0.45)
JAM	0.0005	0.0007	-0.0253[5]
	(0.02)	(0.03)	(-0.85)
R^2	0.11	0.11	0.14
DW	1.99	2.00	1.92
N	125	125	125

Notes:

Equations estimated from pooled cross-section time-series data, by ordinary least squares. t-statistics in parentheses. Superscripts indicate significance levels: 1 = 0.01, 2 = 0.025, 3 = 0.05, 4 = 0.10, 5 = 0.20, 6 = 0.25. R^2 = coefficient of determination, DW = Durbin-Watson statistic, N = number of observations.
Dependent variable = export growth rate (exports of goods and non-factor services in constant 1988 US dollars).
DRER = rate of change in index of real exchange rate;
TIME = index of year;
DTOT = rate of change in index of terms of trade;
$FRIN_{-1}$ = foreign resource inflow (percent of GDP), lagged one year;
Country dummies: BRB = Barbados, CRI = Costa Rica, DOM = Dominican Republic, JAM = Jamaica.

Table 10

Export Growth Equations, with AR1 Adjustment

Variable	Equation Number (1)	(2)	(3)
Constant	0.0596[2]	0.0589[2]	0.0573[2]
	(2.21)	(2.19)	(2.13)
DRER	0.1649[2]	0.1751[2]	0.1689[2]
	(1.96)	(2.04)	(2.04)
TIME	-0.0025[2]	-0.0024[2]	-0.0017[4]
	(-2.02)	(-1.98)	(-1.29)
DTOT		0.0439[6]	
		(0.68)	
$FRIN_{-1}$			0.4197[2]
			(2.15)
BRB	0.0270[5]	0.0268[5]	-0.0087
	(0.96)	(0.96)	(-0.27)
CRI	0.0520[3]	0.0523[3]	0.0237[6]
	(1.87)	(1.88)	(0.77)
DOM	0.0429[4]	0.0431[4]	0.0127
	(1.55)	(1.56)	(0.41)
JAM	0.0006	0.0008	-0.0262[5]
	(0.02)	(0.03)	(-0.86)
R^2	0.10	0.11	0.14
DW	2.00	2.00	1.98
rho	0.00	0.00	0.03
	(0.05)	(0.00)	(0.29)
N	124	124	124

Notes:
Equations estimated from pooled cross-section time-series data. Adjusted for first-order serial correlation of the error, by Cochrane-Orcutt iterative technique. t-statistics in parentheses. Superscripts indicate significance levels: 1 = 0.01, 2 = 0.025, 3 = 0.05, 4 = 0.10, 5 = 0.20, 6 = 0.25. R^2 = coefficient of determination, DW = Durbin-Watson statistic, rho = autocorrelation coefficient, N = number of observations.
Dependent variable = export growth rate (exports of goods and non-factor services in constant 1988 US dollars).
DRER = rate of change in index of real exchange rate;
TIME = index of year;
DTOT = rate of change in index of terms of trade;
$FRIN_{-1}$ = foreign resource inflow (percent of GDP), lagged one year;
Country dummies: BRB = Barbados, CRI = Costa Rica, DOM = Dominican Republic, JAM = Jamaica.

Table 11

Export Growth Equations

	Equation Number				
Variable	(1)	(2)	(3)	(4)	(5)
Constant	0.0470[3] (1.82)	0.1012[1] (4.78)	0.1059[1] (2.77)	-0.0224 (-0.24)	0.1283[1] (4.15)
DRER	0.1665[2] (2.04)	0.1732[2] (2.11)	0.1817[2] (2.15)	0.1656[2] (1.99)	0.1688[2] (2.05)
TIME	-0.0026[2] (-2.13)	-0.0026[2] (-2.13)	-0.0026[2] (-2.10)	-0.0026[2] (-2.09)	-0.0026[2] (-2.11)
AGRGDP1	0.2506[1] (2.36)				
MINGDP1		-0.2193[2] (-2.18)			
MANGDP1			-0.1325 (-0.63)		
SRVGDP1				0.3147[4] (1.20)	
INFGDP1					-0.2874[3] (-1.81)
R^2	0.10	0.10	0.06	0.07	0.09
DW	1.98	1.97	1.90	1.48	1.95
N	125	125	125	125	125

Table 12

Export Growth Equations

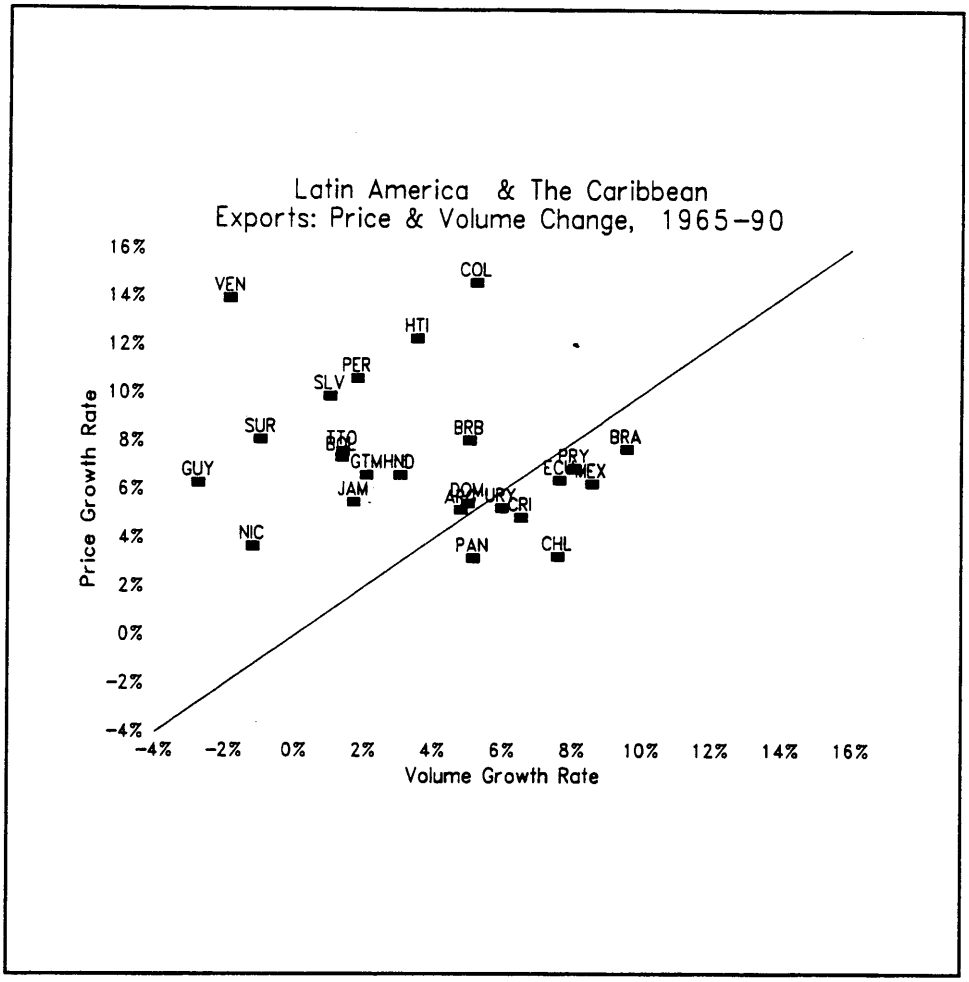
Variable	Equation Number (6)	(7)	(8)	(9)	(10)
Constant	0.0525[3] (1.92)	0.0927[1] (3.36)	0.1203[1] (4.24)	0.1060[1] (4.54)	0.1248[1] (3.17)
DRER	0.1573[3] (1.90)	0.1751[2] (2.09)	0.1828[2] (2.21)	0.1545[3] (1.86)	0.1567[3] (1.86)
TIME	-0.0025[2] (-2.09)	-0.0026[2] (-2.09)	-0.0026[2] (-2.13)	-0.0025[2] (-2.09)	-0.0025[2] (-2.08)
RKAVG	0.0110[3] (1.78)				
RKED		-0.0024 (-0.38)			
GDP1			-0.0001[3] (-1.73)		
POPDEN1				-0.0001[3] (-1.71)	
ERP					-0.0231[4] (-1.29)
R^2	0.08	0.06	0.08	0.08	0.07
DW	1.94	1.90	1.94	1.94	1.92
N	125	125	125	125	125

Table 13

Export Growth Equations

Variable	Equation Number (11)	(12)	(13)	(14)
Constant	0.0441[5] (1.15)	0.0547[3] (1.79)	0.0794[1] (3.26)	0.0500[5] (1.00)
DRER	0.1825[2] (2.19)	0.1800[2] (2.17)	0.1670[2] (1.97)	0.1648[2] (1.96)
TIME	-0.0026[2] (-2.12)	-0.0026[2] (-2.11)	-0.0026[2] (-2.08)	-0.0025[2] (-2.08)
GVTGDP	0.3700[4] (1.29)			
NIGDP		0.0016[4] (1.34)		
CVNER			0.0081 (0.46)	
CVRER				0.1634[6] (0.80)
R^2	0.07	0.07	0.06	0.07
DW	1.92	1.91	1.89	1.90
N	125	125	125	125

Figure 1


Latin America & The Caribbean
Exports: Price & Volume Change, 1965-90
Price Growth Rate
Volume Growth Rate
16%
14%
12%
10%
8%
6%
4%
2%
0%
-2%
-4%
-4%
-2%
0%
2%
4%
6%
8%
10%
12%
14%
16%
VEN
COL
HTI
PER
SLV
SUR
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BRA
GUY
GTM
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JAM
PRY
MEX
CRI
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PAN
CHL

Figure 2

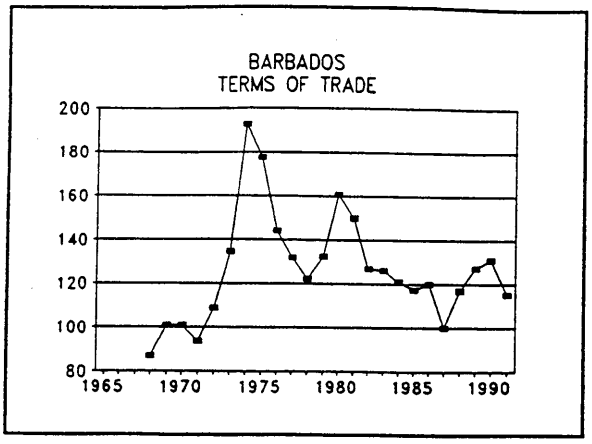


Figure 3

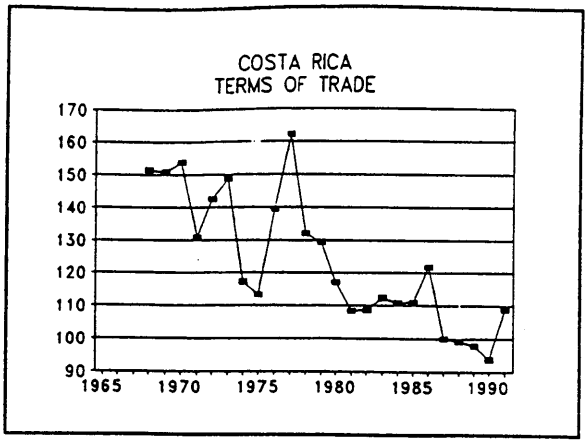


Figure 4

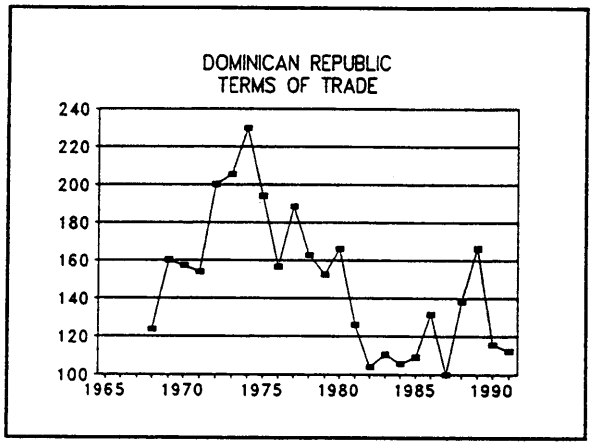


Figure 5

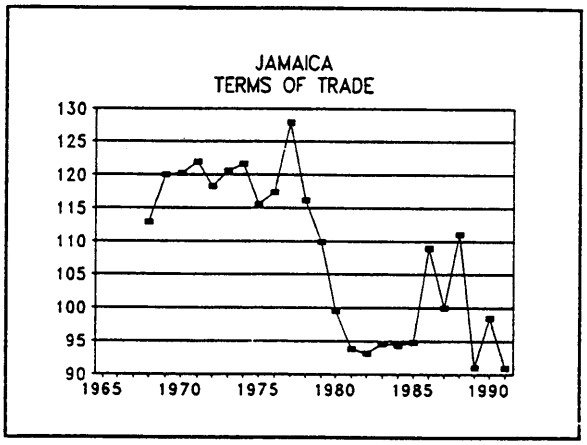


Figure 6

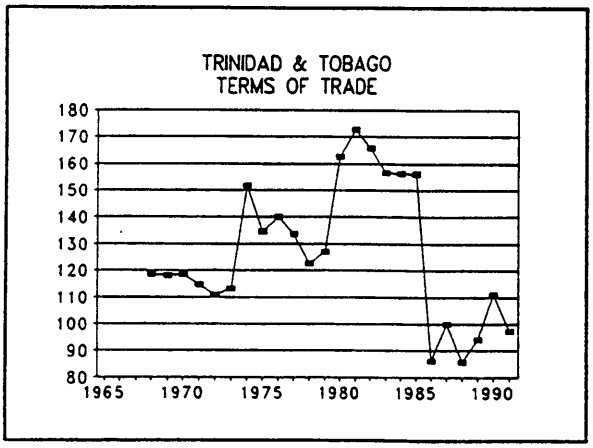


Figure 7

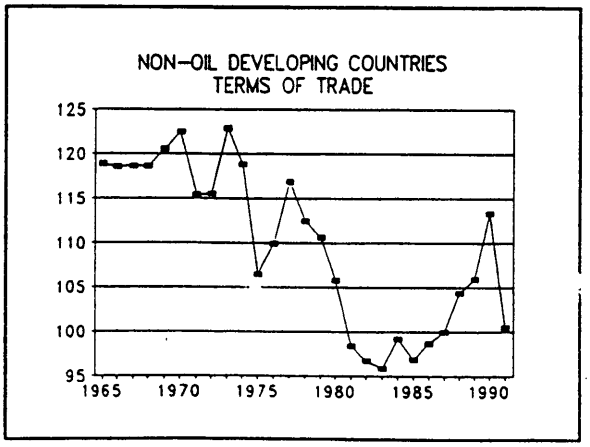


Figure 8

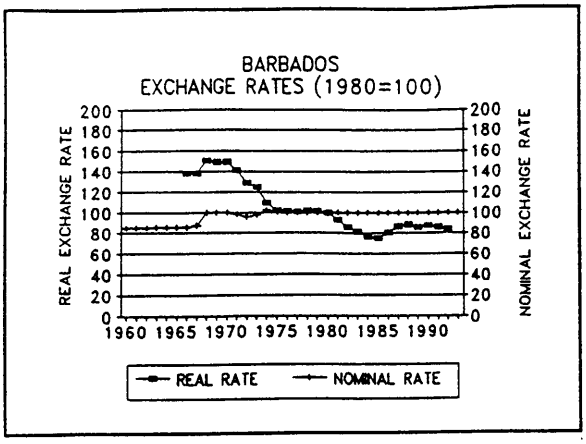


Figure 9

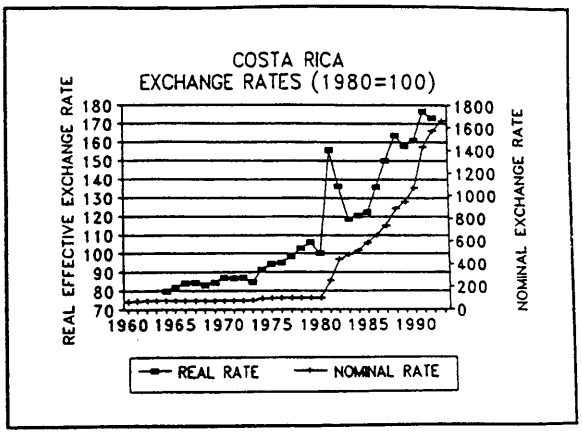


Figure 10

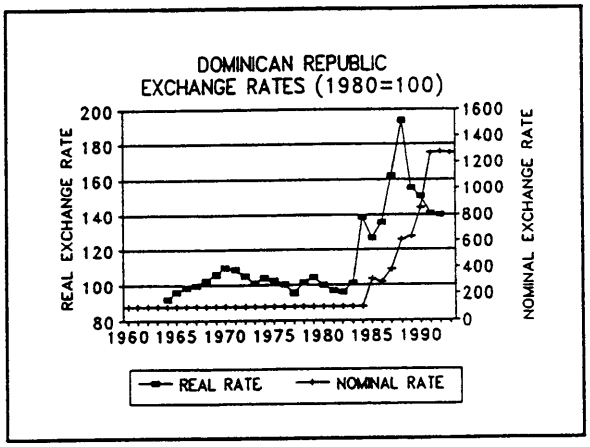


Figure 11

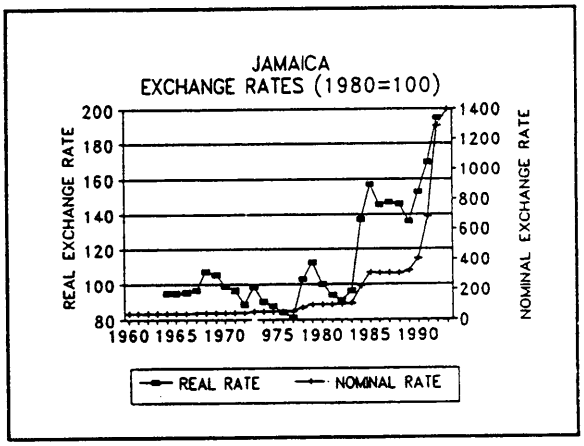


Figure 12

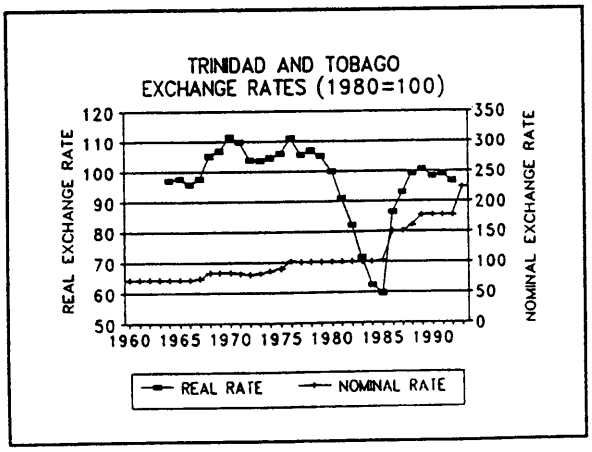
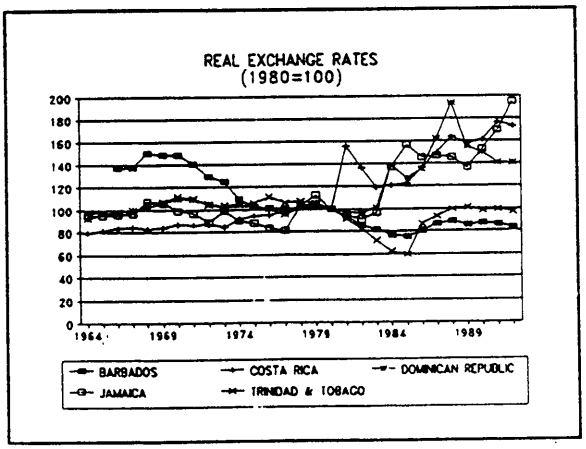


Figure 13



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